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THE ARITHMETIC OF FOREIGN EXCHANGE

Being Part II of
THE PRINCIPLES AND ARITHMETIC OF FOREIGN EXCHANGE

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PART II

THE ARITHMETIC OF FOREIGN EXCHANGE

CHAPTER XXIII

ARITHMETICAL OPERATIONS AND CONTRACTED METHODS

THE imperative need for speed as well as accuracy in calculations which have to be made in a busy commercial house must be obvious to every reader. For this reason, and, at the risk of covering ground which should already be familiar, a few examples of abbreviated and contracted arithmetical methods are appended.

1. **Abbreviated Multiplication.**—The following short cuts should always be used.

To multiply by—

5	add	a nought,	and	mentally halve.
9	,,	,,	,,	deduct multiplicand.
11	,,	,,	,,	add multiplicand.
20	,,	,,	,,	double.
25	add	two noughts,	and	mentally divide by 4.
125	,,	three ,,	,,	,, ,, ,, 8.

Much labour can be saved, when multiplying two quantities, by a judicious arrangement of the work, and by keeping a careful watch for digits or sets of digits in the multiplier, which are multiples of other digits following or preceding them.

In deciding which of two quantities to take as the multiplier, select that one which the more easily lends itself to this method.

Example 1.

324567	×	13212
13212		
3894804	=	× 12 — 12
42842844	=	1100 × 12 = 13200
4288179204		13212

Choose 13212 as multiplier, since 324567 cannot easily be split up. Multiply first by 12, and then multiply the first product obtained by 11, taking care to place the first figure obtained in the second multiplication under the third place figure of the first product.

Example 2.

765389 × 189279

189279

6888501 × 9

20665503 = 30 × 9 = 270

144658521 = 700 × 270 = 189000

144872064531 189279

189279 makes the best multiplier. Multiply first by 9, then multiply the first product by 3, and so on.

Example 3.

561243 × 168852

168852

6734916 × 12

47144412 = 70 × 12 = 840

94288824 = 200 × 840 = 168000

94767003036 168852

In the last example we obtain three products instead of six, and the saving is considerable. The student should be continuously on the watch for similar cases in which a multiplier can be split up into its components, and should note that the presence of a decimal point does not hinder the application.

2. **Abbreviated Division — The Italian Method.** — The Italian method of division provides for the simultaneous performance of the operations of division and subtraction as the division proceeds, and effects a great saving of time and labour.

In the usual method of long division, the products obtained by multiplying the divisor by the digits in the quotient are written down, and then subtracted, but in the Italian method the remainder *only* is written down as we proceed, the multiplication and subtraction being performed mentally.

An example will make this clear:—

Example 1.—257868 ÷ 1102.

METHOD:—

(1) Draw a line under the figures of the dividend required for the first division.

(2) Multiply the divisor by the first figure in the quotient, and subtract as you proceed, writing down the figures in the remainder.

(3) Bring down the next figure of dividend, draw a line and proceed as before, using the second figure of the quotient, and so on.

	(*a*)	
1102)257868(234	$2 \times 2 = 4$,	4 from 8 = 4 (written down).
3746	$2 \times 0 = 0$,	0 ,, 7 = 7 ,, ,,
4408	$2 \times 11 = 22$,	22 ,, 25 = 3 ,, ,,

Bring down next figure 6, and so on for other lines, until the answer is obtained.

In practice, instead of subtracting, we write down as the remainder the figure required to make up to the figure above the product obtained by multiplying as in column (*a*), adding to the next multiplication any resulting tens figure.

Example 2.—78934563 ÷ 1768.

Proceed as follows:—

		(*a*) (*b*)(*c*)
1768)78934563(44646		$4 \times 8 = 32 + 1 = 33$
8214	$4 \times 6 = 24$,	$24 + 3 = 27 + 2 = 29$
11425	$4 \times 7 = 28$,	$28 + 2 = 30 + 8 = 38$
8176	$4 \times 1 = 4$,	$4 + 3 = 7 + 0 = 7$
11043		
Remainder 435		

Column (*a*) gives the figures to be written down for the remainder. Column (*b*) gives the figures to be carried forward at each step. Column (*c*), read upwards from 7, the bottom figure, indicates that the working is correct.

This method can be applied to decimals, and also to compound division involving money, weights and measures, and it should always be made use of by the student for these calculations. In such cases the compound quantities should be decimalised, and the division proceeded with in the ordinary way.

Example 3.—£7215 16s. 9d. ÷ 234.

£7215 16s. 9d. = £7215·8375.

```
234)7215·8375(30·8369
   195 8
   ------
     8 63
     ----
     1 617          = £30 16s. 8¾d.
     1 404
     -----
      2135
      2106
      ----
        29
```

Contracted Methods applied to Decimals.—Decimal notation is used in most business calculations, and for practical purposes it is usually only necessary to work results correct to a given number of decimal places. By using contracted methods all superfluous work is avoided without affecting the accuracy of the result. For instance, in dealing with money, a calculation to the third place of decimals gives a result correct to the nearest farthing. In working problems involving decimals, the result should be obtained to one place more than is actually necessary, so as to ensure that the subsequent approximation is correct to the place required.

In approximating a decimal to a required place, allowance must be made for the succeeding figure, and if this is 5 or more, 1 should be added to the last digit required.

Examples :—

345·627456 is 345·6 correct to one place (nearest tenth).
345·63 ,, ,, two places (nearest hundredth).
345·627 ,, ,, three places (nearest thousandth).
345·6275 ,, ,, four places (nearest ten-thousandth).
345·62746 ,, ,, five places (nearest hundred-thousandth).

Addition and Subtraction.—In addition and subtraction the rule for obtaining the sum of several decimal quantities approximately correct to a given place is simple enough.

Rule : Approximate the quantities to one place more than that required, and add or subtract to this place, approximating the answer obtained to the required place.

This rule generally gives sufficiently correct results, but if a large number of quantities are to be added, two or three extra places should be allowed, on account of the large carrying figures.

Example 1.—Add ·00743, 4·03459, 2·76745, 17·68, 8·5916 and 6·54329 *correct* to two decimal places.

(*a*)

In full		
	·00	743
	4·03	459
	2·76	745
	17·68	
	8·59	16
	6·54	329
	39·62	436

= 39·62 to two places.

(*b*)

Contracted method		
	·00	7
	4·03	5
	2·76	7
	17·68	
	8·59	2
	6·54	3
	39·62	

The third place in the answer is not written down, but allowance is made for the figure carried.

Example 2.—Subtract 29·7653929 from 47·876549 correct to three places.

47·876	5
29·765	4
18·111	

= Answer *correct* to three places.

Example 3.—Subtract 107·6348987 from 207·3214579 correct to five places.

207·32145	8
107·63489	9
99·68656	

= Answer *correct* to five places.

To obtain the answer *approximately correct* to five places, we add 1 to the fifth place to allow for the 9 in the sixth, and obtain, as the answer, 99·68656.

Contracted Multiplication of Decimals.—In multiplying two quantities correct to a given place, the calculation should generally be made to one place more than that required, so as to obtain a proper approximation.

The following method should be used:—

(1) Choose as multiplier the quantity which will give least work.

(2) Reverse the multiplier and place the units digit under that digit in the multiplicand which is one place further to the right than the number of places required correct. If the multiplier has no units figure, supply its place with a 0.

(3) Multiply each figure of the multiplier into the digit directly above it, and those to the left of it, allowing for the nearest multiple of 10 from the figure to the right.

(4) Set down the products so that the right-hand figure in each case is directly under the units figure in the multiplier.

(5) The decimal point will be in the same place as in the multiplicand if the figures are all kept in proper columns.

Example 1.

373·86150 × 27·295 to three places.

·59272

7477·2300	(*a*) 27·295 is best multiplier.
2617·0305	(*b*) Place units figure 7 under fourth place
74·7723	digit 5 of the multiplicand.
33·6475	(*c*) Multiply $2 \times 0 = 0$ which is set down in
1·8693	fourth place under units figure 7.
10204·5496	$7 \times 5 = 35, \therefore 5$ goes in fourth place.

Answer *correct* to three places is 10204·550.

Example 2.

1234·5672 × ·003241 to three places.

142·3000

3·7037	(*a*) No units figure in ·003241, therefore place
·2469	0 under 2 and reverse.
·0494	(*b*) Multiply $3 \times 5 = 15 + 2$ carried (18 is
·0012	nearer 20 than 10), gives 7 to be placed
Answer = 4·001	in fourth place.

Method of Prediction.—When multiplication is to be done to a certain degree of accuracy only, it is often unnecessary to use all the figures in the numbers that are multiplied together. Hence, if we can determine how many figures we shall need at each stage of the calculation, we can economise our labour very much. For this purpose the *Method of Prediction* is used.

The method is very simple, and can be applied very quickly; but, like many other things that are quite easy to put into practice, it needs a somewhat long explanation.

RULES FOR MULTIPLICATION.

FIRST STEP.—Make a rough estimate of the product by approximating the given numbers to one figure accuracy and multiplying them together. This will indicate the position of the decimal point in the result, and show that the final answer will contain either (*a*) a given number of digits to the left of the decimal point, or (*b*) a given number of noughts to the right of the decimal point.

Example 1.—22·1324156 × 4·3256398 correct to two places.

This is, roughly, 20 × 4 = 80.
Hence the answer will have two digits to the *left* of the decimal point.

Example 2.—11·321456 × ·00032392 correct to three places.

This is, roughly, 10 × ·0003 = ·003.
Hence the answer will have two noughts to the *right* of the decimal point before the first significant figure occurs.

SECOND STEP.—Using the information thus obtained by our rough estimate, we now have to determine how many of the original figures in each of the quantities to be multiplied we may use in our multiplication in order to obtain an answer that will be correct to the necessary number of places. To this end, we apply the following simple rule:—

The number of figures which must be taken in *each* of the original numbers for the multiplication is the number of places required correct in the answer, *plus* two figures (for correct approximation), and (applying the result of our rough estimate) (*a*) *plus* the number of digits to the left of the decimal point in the product, or (*b*) *minus* the number of initial noughts to the right of the decimal point in the product. Thus:—

(*a*) In Example 1:—

Places required correct in answer	= 2
Extra figures for approximation	= 2
Estimated digits in answer	= 2
Figures to be taken in each quantity to be multiplied	= 6

(*b*) In Example 2:—

Places required	= 3
Extra figures	= 2
	5
Less estimated noughts in answer	= 2
Figures to be taken in each quantity	= 3

In applying these results, we must take care to write down the *multiplicand* so that its right-hand figure is one place to the right of the *multiplier*: then, automatically, the left-hand figure of the multiplier (reversed) will be one place to the left of the multiplicand. This will give exactly the same arrangement as was described on page 555 under "Contracted Multiplication of Decimals," i.e., the units digit of the multiplier will be under that digit of the multiplicand which is one place further to the right than the number of places required correct.

Observe that, as we have already made a rough estimate of our answer, we need not insert decimal points in our working; for we shall know exactly where to put the decimal point when the multiplication is finished.

The examples would be completed as follows:—

Example 1.—22·1324156 × 4·3256398 correct to two places.

As we are to take only six figures from the multiplicand, 4·3256398, we approximate it to 4·32564.

221324
465234

88530
6640
443
111
13
1

9574

Answer correct to two places = 95·74.

In fixing the place of the decimal point in our answer, we must use our rough estimate carefully and intelligently. As, in obtaining it, we approximated our two quantities only to *one figure accuracy,*

it is possible that our final answer might have three, instead of *two*, digits before the decimal point.

Suppose that the figures in Example 1 had been

$$24 \cdot 1324156 \times 4 \cdot 3256398$$

our rough estimate would give us, as before,

$$20 \times 4 = 80$$

But on carrying out our short method multiplication we should obtain

$$\begin{array}{r} 241324 \\ 465234 \\ \hline 96530 \\ 7230 \\ 483 \\ 121 \\ 14 \\ 1 \\ \hline 104379 \\ \hline \end{array}$$

Now we roughly estimated that our answer should be 80, and we know that it cannot be less: it certainly cannot be as little as 10. Actually, our answer is bound to be more than 80 because, in our rough estimate, we took approximate figures (20×4) which are less than those in the quantities to be multiplied. Hence we can see at once that the decimal point comes after the first *three* figures and that our answer must be $104 \cdot 379$.

Example 2.—$11 \cdot 321456 \times \cdot 00032392$ correct to three places.

$$\begin{array}{r} 113 \\ 423 \\ \hline 34 \\ 2 \\ \hline 36 \\ \hline \end{array}$$

Answer correct to three places = $\cdot 004$.

It so happens in this instance that the figure 4 in the multiplier is not needed: but you will easily see that it *might* have yielded a carry-over figure which might have affected the answer. Hence you will realise that the method gives a margin of safety.

The insertion of the two noughts is done by reference to the original rough estimate on which all the work has been based.

Example 3.—172·856432 × ·0041587 to two places.

This is, roughly, 200 × ·004 = ·8.
There are no integers and no initial noughts in the answer.

Places required correct	=	2
Extra figures for approximation	=	2
Figures to be taken	=	4

```
  1729
 9514
------
  692
   17
    9
    1
------
  72
------
```

Answer correct to two places = ·72.

Observe that, in this case, the 9 in the multiplier was necessary for the sake of the carry-over.

Contracted Division of Decimals.—To find a quotient correct to a given number of places, it is necessary to obtain one place more for correct approximation, though the last figure need not actually be written.

The Method of Prediction is as follows:—

(1) Make a rough estimate of the answer and so determine the place of the decimal point.
(2) The number of figures to be retained in the *divisor* is the number of places required correct in the answer, *plus* one figure (for correct approximation) and (applying the result of our rough estimate) (*a*) *plus* the number of figures to the left of the decimal point in the quotient, or (*b*) *minus* the number of initial noughts to the right of the decimal point in the quotient.
(3) The number of figures to be retained in the *dividend* is that which will allow the divisor so obtained to be utilised entirely *or the first division.*
(4) For the second and subsequent divisions, discard figures one

by one from the divisor so that it will divide into the successive remainders.

Example 1.—373·81936 ÷ 8·7243 correct to two places.

This is, roughly, 400 ÷ 9 = about 40.

∴

Places required correct in answer = 2
Extra figure for approximation = 1
Estimated integers in quotient = 2
Figures to be retained in the divisor = 5

By inspection, we see that the first figure 8 of the divisor will not go into the first figure 3 of the dividend, but that it will go into the first two figures, viz., 37. Hence, the number of figures to be retained in the dividend must be *one more* than the figures to be taken in the divisor, i.e., 6.

```
8'7'2'4'3)373819(42848
          24847
          ------
           7398
           7398
           ----
            419
            ---
             70
             --
```

Answer correct to two places = 42·85.

In the above example the number of figures in the divisor happened to coincide with the number required by the prediction.

The position of the decimal point was determined by the rough estimate.

Example 2.—373·81936 ÷ 87·24367 correct to three places.

Rough estimate = 400 ÷ 90 = about 4.

Number of divisor digits = 3 + 1 + 1 = 5.

By inspection, number of dividend digits must be one more than number in divisor = 6.

```
87'2'4)373819(42848
          24843
          -----
           7394
           7392
           ----
            415
            416
            ---
             66
             --
```

Answer correct to three places = 4·285.

Example 3.—373·819567 ÷ 8724·3241 correct to three places.

Rough estimate, $= \frac{400}{9000}$ = about ·04

Places required correct in answer	= 3
Extra figure for approximation	= 1
	4
Estimated noughts after decimal point in answer	= 1
Number of divisor digits	= 3

8′7′2)3738(428
250
76

Answer correct to three places = ·043.

Example 4.—87·64091 ÷ 3738·7 correct to four places.

Rough estimate, 90 ÷ 4000 = about ·02.

Divisor digits, 4 + 1 − 1 = 4.

Dividend digits = 4.

3′7′3′9)8764(2344
1286
164
15

Answer correct to four places = ·0234.

Example 5.—8972·8345 ÷ 241·73 correct to two places.

Rough estimate, 9000 ÷ 200 = 45.

Divisor digits = 2 + 1 + 2 = 5.

Dividend digits = 5.

24′1′7′3)89728(3712
17209
288
47

Answer correct to two places = 37·12.

Division of Money.—The method of prediction is very useful in division of money, and, as before indicated, the answer is taken correct to *three* places to get a result correct to farthings.

Example 6.—£98732 19s. 6d. ÷ 7456.

$$\text{Rough estimate} = \text{about } \frac{100000}{8000} = \text{about } 13.$$

Divisor digits = 3 + 1 + 2 = 6.
Dividend digits = 6.

As there are only four digits available in the divisor, we must use it three times before contracting it by casting off the figures. This is equivalent to extending it to the estimated six figures by adding noughts.

$$\begin{array}{r} 7'5'4'6)\overline{987330}(130841, \text{ say } 13084 \\ \underline{23273} \\ \underline{6350} \\ \underline{313} \\ \underline{11} \end{array}$$

Answer = £13 1s. $8\frac{1}{4}$d.

Combined Multiplication and Division.—In many exchange calculations a multiplication of quantities is followed by a division of the product by another quantity.

Example 7.— $\dfrac{3{\cdot}18252 \times 1{\cdot}92743}{7541{\cdot}09}$ correct to four places.

In the actual working of problems of this type, the numerator should always be calculated first, and the last operation should be the division of the numerator by the denominator. But in making the prediction to minimise the figures used, the last operation—i.e., the division—is always considered first and the other operations are considered in the opposite order to that in which they will actually be done. Thus, in the example:—

$$\text{Rough estimate} = \frac{6}{8000} = \text{about } {\cdot}0007 \text{ or } {\cdot}001.$$

When a rough estimate is less than unity and its first significant figure is 5 or more, it is safest to take it as 1 in the next place towards the decimal point. Thus, if a rough estimate gives ·0007, call it ·001; if it gives ·05, call it ·1. This leads to the retention of *one more figure* throughout (because the number subtracted in finding the divisor digits is one less) and makes the possibility of a doubtful answer negligible. Hence,

Divisor digits (taking ·001) = 4 (places required correct) + 1 (for approximation) − 2 (noughts) = 3.
Dividend digits = 3.
Digits to be retained in original numerator numbers = 5.

We arrive at the figures to be retained in the original numbers in the numerator by remembering that the dividend is the product of those numbers, and then, according to the Second Step under "Method of Prediction" above, by adding two figures for safety.

The example will appear as follows:—

$$
\begin{array}{r}
31825 \\
47291 \\
\hline
3183 \\
2864 \\
64 \\
22 \\
1 \\
\hline
7'5)613\ (81 \\
\underline{13} \\
\end{array}
$$

Answer correct to four places = ·0008.

Example 8.— $\dfrac{13{\cdot}8254 \times {\cdot}791026}{8541{\cdot}09}$ correct to three places.

Rough estimate $\dfrac{10 \times {\cdot}8}{9000} = {\cdot}001$.

Divisor digits = 3 + 1 − 2 = 2. Dividend digits = 2.
∴ Figures to be retained in original numerator numbers = 4.

$$
\begin{array}{r}
1383 \\
0197 \\
\hline
968 \\
124 \\
1 \\
\hline
8'5)109(13 \\
\underline{24} \\
\end{array}
$$

Answer correct to three places = ·001.

In this example we calculated on the need for two digits in the product of the numbers in the numerator. As it happened, the carry

over in the addition provided us with three. The method of prediction allows for this possibility, and, when it occurs, the extra figure should be retained. Thus, in this instance we use 109 for our dividend —a three-figure number instead of the two-figure number we expected to get. In other words, the dividend digits predicted are a *minimum*; if another digit is needed it will come automatically.

CHAPTER XXIV

DECIMALISATION OF MONEY AND INTEREST CALCULATIONS

Decimalisation of Money.—The currency units of most foreign countries are divisible into 100 parts, and fractional quantities are expressed as decimals of the unit of currency. As foreign exchange rates are usually quoted in decimals, and as most exchange, as well as the majority of commercial calculations are made in decimals, it is imperative that the student of Foreign Exchange should be able to decimalise any sum in English currency quite quickly and easily. Several methods can be used, but the most practical is given below.

Method :—

(*a*) The number of £'s is the integral part of the decimal.
(*b*) The number of complete florins gives the first decimal place.

Note : 2s. $= £\frac{1}{10} = \cdot 1$.

(*c*) The next two places = the number of farthings in the remaining shillings and pence plus 1 for each complete 24 farthings.
(*d*) The remaining places are obtained by dividing by 6 the number of pence and farthings (expressed as a decimal of a penny) in excess of sixpence, or all the pence and farthings if less than sixpence, writing the resulting figures in the fourth and subsequent places.

Example 1.—Express £702 17s. $3\frac{1}{4}$d. as a decimal.

(*a*)		£702
(*b*) No. of complete florins	=	·8
(*c*) Remainder = 1s. $3\frac{1}{4}$d. = 61 farthings + 2	=	·063
(*d*) Pence and farthings under sixpence = $3 \cdot 25 \div 6$	=	·0005416̇
Answer :		£702·8635416̇

Example 2.—£302 9s. 10½d.

(*a*)		£302
(*b*) No. of complete florins	=	·4
(*c*) Remainder = 90 + 3	=	·093
(*d*) Pence and farthings over sixpence = 4·5 ÷ 6	=	·00075
		£302·49375

Example 3.—£117 18s. 5¾d.

(*a*)		£117
(*b*)		·9
(*c*) 23		·023
(*d*) 5·75 ÷ 6	=	·0009583
		£117·9239583

Example 4.—£129 16s. 0¼d.

(*a*)		£129
(*b*) Florins		·8
(*c*) Remainder, 1		·001
(*d*) ·25 ÷ 6	=	·0000416
		£129·8010416

In these examples the answer is obtained correct to several places of decimals, but for practical purposes it is usually quite sufficient to decimalise an amount correct to three places of decimals. The degree of correctness required will, of course, depend on the problem which has to be solved, and if a multiplication of the amount is necessary, the complete decimal should be obtained by the foregoing method.

The decimalisation of a quantity to the nearest third place is most easily done by the following method, which depends on the facts that—

2s.	=	$£\frac{1}{10}$	= £·1
1s.	=	$£\frac{1}{20}$	= £·05
6d.			= £·025 (= 24 farthings)
1s. 6d. = 1s. + 6d.			= £·075
¼d.	=	$£\frac{1}{960}$	= £·001 (approximately)

Rule :—

(1) The number of complete £'s is the integral portion of the decimal.

(2) The first place is the number of complete florins, adding ·05 for an odd shilling, and ·025 for an odd sixpence, in the remainder.

(3) Add in the second and third places the number of farthings in the remainder + 1 if 12 or over.

By this method the decimal is correct to the nearest third place, and practice will enable the operations to be made mentally, quite rapidly and easily. It should be observed that by many other methods the figure obtained in the third place for amounts such as $10\frac{3}{4}$, $11\frac{3}{4}$, etc., is incorrect by ·001.

Example 1.—£414 16s. $10\frac{3}{4}$d.

(1)	£414
(2) 16s. 6d.	·825
(3) $4\frac{3}{4}$d. = 19 + 1	·020
	£414·845

Example 2.—£719 17s. $6\frac{1}{4}$d.

(1)	£719
(2) 17s. 6d.	·875
(3) $\frac{1}{4}$d.	·001
	£719·876

Example 3.—£814 15s. $5\frac{3}{4}$d.

(*a*)	£314
(*b*) 15s.	·75
(*c*) $5\frac{3}{4}$d. = 23 + 1	·024
	£814·774

or £814 15s. 6d. = £814·775

Less $\frac{1}{4}$d. = ·001

£814·774

Example 4.—£505 19s. $11\frac{3}{4}$d.

(*a*)	£505
(*b*) 19s. 6d.	·975
(*c*) $5\frac{3}{4}$d. = 23 + 1	·024
	£505·999

or £506 = £506

Less $\frac{1}{4}$d. = ·001

£505·999

Note: **The second method shown in Examples 3 and 4 should always be used when the quantities are nearly complete sixpences or shillings.**

In decimalising money, the working need not be shown as in these examples, but should be done mentally, and the result only written down.

Conversion of Decimals into £ s. d.—For most practical purposes **it is only necessary to express a given sum of money to the nearest farthing, and this can be obtained by reducing a decimal quantity to its nearest third place, after which proceed as follows:—**

(*a*) Find by inspection the decimal representing the *nearest* sixpence (*Note:* 6d. = ·025, 1s. = ·05, 1s. 6d. = ·075), and, as previously indicated, the first place of decimal represents florins.

(*b*) Ascertain the difference, call this farthings, and add or subtract, as the case may be.

The integral part of the decimal is, of course, £'s.

Example 1.—**Convert £·724 to £ s. d.**

(*a*) Nearest 6d. = ·725 or 14s. 6d.

(*b*) Difference = ·001, ∴ deduct one farthing.

Answer = 14s. $5\frac{3}{4}$d.

Example 2.—**Reduce £504·939 to £ s. d.**

	£504		
(*a*) Nearest 6d. is ·95 or		19	0
	£504	19	0
(*b*) Difference = ·011,			
∴ deduct			$2\frac{3}{4}$
Answer:	£504	18	$9\frac{1}{4}$

Example 3.—**Reduce £14·56759 to £ s. d.**

Nearest third place = £14·568

	£14		
(*a*) Nearest 6d. is ·575 or		11	6
	£14	11	6
(*b*) Difference = ·007, ∴ deduct			$1\frac{3}{4}$
Answer:	£14	11	$4\frac{1}{4}$

***Example* 4.—Reduce £909·49876 to £ s. d.**

Nearest third place = £909·499
Nearest 6d. would be 909·5 = £909 10s.,
∴ deduct one farthing.
Answer = £909 9s. 11¾d.

Here again the examples are given in full for clearness only, but in practice the working should be done mentally and the answers written down immediately.

Examples.

£112·836	=	£112	16 8¾
£17·76375 = 17·764	=	£17	15 3¼

Great care must be used to see that the decimal representing the *nearest* sixpence is taken, for otherwise the answer will be incorrect. For instance, if in the last example 17·75 were taken as the nearest instead of 17·775, we should add 3½d. (= 14 farthings) instead of deducting 2¾d. (= 11 farthings).

As in all ordinary banking transactions, a dealer who is transacting business with a customer will always work to *the nearest penny in his own favour*. If a dealer has to *debit* a customer with, say, £·495, i.e., 9s. 10¾d., the amount actually debited would be 9s. 11d., or possibly even 10s. 0d.; but if the customer were to be credited with the same amount, the credit would be made out for 9s. 10d.

Rates in Sixteenths, Thirty-Seconds and Sixty-Fourths.—It has already been stated that all fractions used in Foreign Exchange are multiples of $\frac{1}{64}$, and that fractions such as $\frac{2}{3}$, $\frac{5}{7}$ and $\frac{3}{11}$ are never used. Moreover, several pence rates, notably the rates between London and India, are always quoted in pence and fractions which are multiples of one sixty-fourth, e.g., $18\frac{1}{64}$d., $17\frac{31}{32}$d., etc. Hence it is extremely important that both the exchange operator and the student of Foreign Exchange should be able to express any such fractions as decimals with the minimum of trouble and delay. Practised exchange operators can write down the decimal equivalents of any multiple of $\frac{1}{16}$, $\frac{1}{32}$ and $\frac{1}{64}$, but for purposes of the average student the best plan is to memorise the decimal equivalents of the fractions $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{32}$ and $\frac{1}{64}$, and thence to determine the equivalents of the multiples of those fractions in accordance with the examples which follow:—

$\frac{1}{2} = \cdot 5$

$\frac{1}{4} = \cdot 25 \quad \therefore \frac{3}{4} = \cdot 75$

$\frac{1}{8} = \cdot 125 \quad \therefore \frac{3}{8} = \cdot 375, \quad \frac{5}{8} = \cdot 625, \quad \frac{7}{8} = \cdot 875$

$\frac{1}{16} = \cdot 0625 \quad \therefore \frac{3}{16} = \cdot 1875, \quad \frac{5}{16} = \cdot 3125, \quad \frac{7}{16} = \cdot 4375$

$\frac{1}{32} = \cdot 03125 \quad \therefore \frac{3}{32} = \cdot 09375, \quad \frac{5}{32} = \cdot 15625, \quad \frac{7}{32} = \cdot 21875$

$\frac{1}{64} = \cdot 015625 \quad \therefore \frac{3}{64} = \cdot 046875, \quad \frac{5}{64} = \cdot 078125, \quad \frac{7}{64} = \cdot 109375$

The reader will realise that, once the six fractions in the first column are known, any multiples of them can be quickly ascertained, usually in more than one way, e.g.—

$\frac{9}{16} = \frac{1}{2} + \frac{1}{16} = \cdot 5625$

$\frac{11}{16} = \frac{1}{16} + \frac{10}{16} = \cdot 0625 + \cdot 625 = \cdot 6875$; *or*

$= \frac{3}{4} - \frac{1}{16} = \cdot 75 - \cdot 0625 = \cdot 6875$

$\frac{13}{16} = \frac{3}{4} + \frac{1}{16} = \cdot 8125$

$\frac{9}{32} = \frac{1}{4} + \frac{1}{32} = \cdot 28125$

$\frac{11}{32} = \frac{1}{32} + \frac{10}{32} = \cdot 03125 + \cdot 3125 = \cdot 34375$

$\frac{13}{32} = \frac{1}{32} + \frac{3}{8} = \cdot 03125 + \cdot 375 = \cdot 40625$

$\frac{17}{32} = \frac{1}{32} + \frac{1}{2} = \cdot 03125 + \cdot 5 = \cdot 53125$

$\frac{9}{64} = \frac{1}{8} + \frac{1}{64} = \cdot 140625$

$\frac{13}{64} = \frac{1}{8} + \frac{1}{16} + \frac{1}{64} = \cdot 203125$

$\frac{27}{64} = \frac{3}{8} + \frac{3}{64} = \cdot 421875$

$\frac{49}{64} = \frac{3}{4} + \frac{1}{64} = \cdot 765625$

Reduction of Decimals to Sixty-Fourths, etc.—Facility in effecting the reverse operation, i.e., reducing decimals to the nearest thirty-second or sixty-fourth (according to the "step" in the exchange), is equally important. When the decimals corresponding to sixty-fourths are known by heart, the reduction can usually be done by inspection, but, if not, the required result should be ascertained to the nearest sixty-fourth (even though the answer may reduce to 32nds or 16ths), by the following method:—

Example.—Reduce 18·84316d. to the nearest 64th.

Multiply the *decimal* by 64, viz.—

$$\begin{array}{r} \cdot 84316 \\ 8 \\ \hline 6 \cdot 74528 \\ 8 \\ \hline 53 \cdot 96224 \end{array}$$

This gives us $18\frac{53 \cdot 96}{64}$, i.e., $18\frac{54}{64}$ or $18\frac{27}{32}$.

Interest Calculations.—Calculation of interest on a sum of money for a specified period is necessary in many exchange operations. It has been previously pointed out that allowances for interest are necessary in calculating some rates of exchange, and also in determining the prices of bills.

Interest for Multiples or Fractions of a Year.—Simple Interest for a given number of years or for a part of a year is easily calculated by the formula—

$$\text{Interest} = \text{Principal} \times \frac{\text{rate \% p.a.}}{100} \times \text{time.}$$

Example 1.—Find interest on £400 for 2 years at 5 % per annum.

$$\text{Interest} = £400 \times \frac{5}{100} \times 2 = \underline{£40.}$$

Example 2.—Find interest on 575 francs for three months at 4 % per annum.

$$\text{Interest} = 575 \times \frac{4}{100} \times \frac{3}{12} = \underline{5 \cdot 75 \text{ francs.}}$$

Mental Methods.—In all exchange operations when interest has to be calculated, the money should be decimalised if it is not already expressed in this way, as the division by 100 is simply performed in all these calculations by moving the decimal point two places. The following methods should be known:—

(1) Interest at 4 % for three months $= \frac{1}{100}$ of principal, ∴ move decimal point two places to the left (see Example 2 above).

(2) Interest at 1 %, 2 %, 3 %, etc., for three months can be easily found by moving the decimal point two places, and dividing or multiplying by 4, 2, 3, as the case may be, i.e.—

$1\ \% = \frac{1}{4} \times 4\ \%$, ∴ divide by 4
$2\ \% = \frac{1}{2} \times 4\ \%$, ∴ ,, ,, 2
$3\ \% = \frac{3}{4} \times 4\ \%$, ∴ multiply by $\frac{3}{4}$
$6\ \% = \frac{3}{2} \times 4\ \%$, ∴ ,, ,, $\frac{3}{2}$, etc.

Similarly, interest at 4 % for 6, 9 or 12 months can easily be found by dividing by 100, and multiplying by 2, 3 and 4 respectively.

(3) Interest at 5 % for one year $= \frac{5}{100} \times 1 = \frac{1}{20}$th of principal.
∴ Treat £'s in principal as shillings, e.g., 5 % on £625 for 1 year = 625s. = £31 5s.
5 % on £70 15s. (= £70·75) for 1 year = 70·75s. = £3 10s. 9d.

(4) Interest at 5 % for one month $= \frac{1}{240}$ of principal.
∴ Treat £'s of principal as pence, e.g., 5 % on £625 for one month = 625 pence = £2 12s. 1d. By this means interest for any number of months is easily obtained.

(5) Those rates which are met with in exchange calculations can be worked from the basis of the 5 % rate, which is so easily calculated, as shown above, e.g.—

$2\frac{1}{2}\ \% = \frac{1}{2}$ of interest at 5 %
$1\frac{1}{4}\ \% = \frac{1}{4}$,, ,, 5 %.
$3\frac{3}{4}\ \% = (\frac{1}{2} + \frac{1}{4})$,, 5 % or
$(1 - \frac{1}{4})$,, 5 %.
4 % = Interest at 5 % minus $\frac{1}{5}$th of itself.
$4\frac{1}{2}\ \%$ = ,, ,, ,, $\frac{1}{10}$th ,,
6 % = ,, ,, plus $\frac{1}{5}$th ,,
$6\frac{1}{4}\ \%$ = ,, ,, ,, $\frac{1}{4}$,,
$1\frac{1}{2}\ \% = \frac{1}{4}$ of interest at 6 %, etc.

(6) In working rates of interest such as $3\frac{3}{4}$ %, $2\frac{1}{2}$ %, etc., it is often easiest to adjust the principal first, then work interest at 5 % on the adjusted amount.

(*a*) $3\frac{3}{4}$ % on £726 for 1 year
= 5 % on $(\frac{1}{2} + \frac{1}{4})$ of £726 for 1 year
= 5 % ,, £544·5 for 1 year
= 544·5s. = £27 4s. 6d.

(*b*) $2\frac{1}{2}$ % on £827 for 1 month
= 5 % on £413·5 for 1 month
= 413·5 pence = 34s. 5·5d.
= £1 14s. $5\frac{1}{2}$d.

Interest for a Number of Days.—The calculation of interest for a given number of days is more difficult, as 365 factorises only into 73×5. The formula is :—

$$\text{Interest} = \text{Principal} \times \frac{\text{rate per annum}}{100} \times \frac{\text{days}}{365}$$

365 rarely divides out, so a division by 73 would be nearly always necessary to solve the formula. However, multiplying both numerator and denominator by 2, we obtain—

$$\text{Interest} = \frac{\text{Principal} \times 2 \times \text{rate} \times \text{days}}{73000}$$

The division of a decimal quantity by 73000 is easily accomplished by the approximation method known as—

The Third, Tenth and Tenth Rule.

(1) Move the decimal point in the quantity *five* places to the left. i.e. take $\frac{1}{100000}$ of it.
(2) Add to the figure so obtained, $\frac{1}{3}$ of itself, then $\frac{1}{10}$ of $\frac{1}{3}$ of it, and then $\frac{1}{10}$ of $\frac{1}{10}$ of $\frac{1}{3}$ of it.
(3) Deduct $\frac{1}{10000}$ of the sum so obtained, and the result is the amount of interest required, expressed as a decimal.

The student should know this rule by heart, and *always* apply it in interest calculations involving days. The product P × 2 × r × d should first be obtained, and then the point moved, bearing in

mind that we need only work to *five* places to get an answer absolutely correct to farthings.

Note: If the interest rate includes a fraction, e.g. $4\frac{1}{2}$ %, it is frequently not necessary to multiply throughout by 2, because the required denominator 73000 will be obtained in multiplying by the fraction.

Example 1.—Interest on £221 17s. 6d. for 31 days at $4\frac{1}{2}$ % per annum.

$$\text{Interest} = 221\cdot875 \times \frac{9}{100 \times 2} \times \frac{31}{365}$$

$$= \frac{61903\cdot125}{73000}$$

$\frac{1}{100000} \times$ product $= \cdot61903$

$\frac{1}{3} = \cdot20634$

$\frac{1}{10}$ of $\frac{1}{3} = \cdot02063$

$\frac{1}{10}$ of $\frac{1}{10}$ of $\frac{1}{3} = \cdot00206$

$\cdot84806$

Less $\frac{1}{10000}$ $\cdot00008$

$\cdot84798$

$$\text{Answer} = \cdot848 = \underline{\text{£0 16s. 11}\tfrac{1}{2}\text{d.}}$$

$221\cdot875$
279
$1996\cdot875$
$59906\cdot25$
$61903\cdot125$

Move point five places and take five places of decimals.

Proof.

$$\text{£}221\cdot875 \times \frac{9}{200} \times \frac{31}{365}$$

$$= \frac{22\cdot1875 \times 279}{100 \times 73}$$

Multiply by 279 to first place only, because division by 7300 will move point four places.

$22\cdot1875$
$\cdot972$
$199\cdot7$
$1553\cdot1$
$4437\cdot5$
$6190\cdot3$

$73)61\cdot903(\cdot848$

$3\cdot50$

583

$$\text{Answer} = \cdot848 = \underline{\text{£0 16s. 11}\tfrac{1}{2}\text{d.}}$$

Example 2.—**Interest on 74565·75 francs at 7¼ % per annum for 101 days.**

$$\text{Interest} = 74565{\cdot}75 \times \frac{29}{4} \times \frac{2}{200} \times \frac{101}{365} = \frac{37282{\cdot}875 \times 2929}{73000}$$

In this calculation two places correct are sufficient, therefore work to 3, moving decimal five places in principal (as halved).

	·372828 | 75	
	9292 |	
	3·355	
	7·457	
	335·546	
	745·657	
	1092·015	
$\frac{1}{3}$	364·005	**Answer = 1495·91 francs.**
$\frac{1}{10} \times \frac{1}{3}$	36·400	
$\frac{1}{10} \times \frac{1}{10} \times \frac{1}{3}$	3·640	
	1496·06	
Less $\frac{1}{10000}$	·15	
	1495·91	

Interest on Current Account Balances.—When interest is charged or allowed on a current account (as between a banker and one of his agents or customers) the interest has to be calculated on the balance outstanding from time to time as the account is operated. As it would be tedious to work out the interest on each balance separately, it is usual in practice to employ the " decimal " or " product " system. Every time the account is operated the balance is struck, and that balance is multiplied by the days during which it remains unchanged, thus giving a product which, so far as interest is concerned, represents an equivalent balance for one day. The products thus obtained are extended into a " Dr." or " Cr." column according as the balance is debit or credit, and, at the end of the quarter, half-year or other period when the account is ruled off, the products are totalled, and the equivalent in interest at the required rate per cent. is determined either by calculation, as in the following example, or by reference to "Interest Tables", from which it is possible quickly to determine the equivalent of any product at any rate of interest.

Example 1.—A customer's bank balance on 31st December, 1932, is £640. The following transactions take place:—On 20th January he withdraws £220; on 17th February he pays in £155; on 25th February he pays in £200; on 3rd March he withdraws £850; on 17th March he withdraws £130; and on 25th March he pays in £770. Find the balance up to and including 31st March, if the bank allows 2½ % interest on balances and charges 4½ % on overdrafts.

Solution:—

Date.	Particulars.	Dr.	Cr.	Balance		Days.	Products.	
							Cr.	Dr.
		£	£		£			
1932								
Dec. 31	By Balance		640	Cr.	640	20	12800	
1933								
Jan. 20	To Self	220		Cr.	420	28	11760	
Feb. 17	By Cash		155	Cr.	575	8	4600	
,, 25	By Cash		200	Cr.	775	6	4650	
Mar. 3	To Self	850		Dr.	75	14		1050
,, 17	To Self	130		Dr.	205	8		1640
,, 25	By Cash		770	Cr.	565	6	3390	
							37200	2690

The number of days between each pair of transactions is counted by omitting the date of the earlier transaction and including the date of the next transaction.

$$\text{Interest on £37200 for 1 day at } 2\tfrac{1}{2}\ \% = £\frac{37200 \times 5}{365 \times 2 \times 100} = £\frac{186}{73} = £2 \cdot 548$$

$$\text{Interest on £2690 for 1 day at } 4\tfrac{1}{2}\ \% = £\frac{2690 \times 9}{365 \times 2 \times 100} = £\frac{2421}{7300} = £0 \cdot 332$$

Difference £2·216.

Balance on 1st April = £565 + £2 4s. 4d. = £567 4s. 4d.

True Present Worth and True Discount.—If a sum of money (P) is subject to interest (r) for a given period (t), the amount (A) of the money plus interest at the end of the period is given by the formula:

$$\text{Amount} = \text{Principal } \textit{plus} \left(\text{Principal} \times \frac{\text{rate}}{100} \times \text{time} \right)$$

$$\text{or } A = P + P \times \frac{r}{100} \times t$$

$$\text{i.e., } A = P\left(1 + \frac{rt}{100}\right)$$

Now the *True Present Worth* of a sum of money which is due to be paid at the expiration of a given period is that sum which, with

interest on itself, will amount to the sum of money to be paid; so that, in the formula, P is the true present worth of the amount A. Further, the difference between the sum which is subject to interest and its Amount (including interest) at the end of a given period is known as the *True Discount* on the Amount for the period in question at the rate of interest concerned. In other words,

$$A - P = \text{True Discount on A.}$$

It will be clear that the terms True Present Worth and True Discount involve no principle different from those involved in determining interest, and that true discount on the *amount* corresponds to interest on the principal, whilst true present worth is the principal which ultimately becomes the amount.

Example 1.—What is the true discount on £133 5s. due in six months at 5 % ?

Solution:—

We have to find a sum which, in six months at 5 % interest, will amount to £133 5s.

Now £100 in 6 months @ 5 % becomes £102½.

$$\therefore \text{ True discount on } £102\tfrac{1}{2} = £2\tfrac{1}{2}$$

$$\therefore \text{ True discount on } £133\tfrac{1}{4} = £\frac{2\tfrac{1}{2} \times 133\tfrac{1}{4}}{102\tfrac{1}{2}}$$

$$= \underline{£3\ 5s.}$$

Example 2.—What is the true present worth of £500 due in three months, if the discount rate is 4 % ?

Solution:—

In 3 months @ 4 % £100 becomes £101.

$$\therefore \text{ £101 is the amount of £100 in 3 months @ 4 \%.}$$

$$\therefore \text{ £500 is the amount of } £\frac{100 \times 500}{101} \text{ in 3 months @ 4 \%.}$$

$$= \underline{£495\ 1s.\ 0d.}$$

Bankers' Discount (Commercial Discount).—When a bill of exchange is discounted, it is the practice to calculate the discount, at the agreed rate, on the face value of the bill for the period of time which the instrument has to run before maturity. Thus bankers' discount at 4 % per annum on a bill for £100 due in three months' time would be roughly:—

$$100 \times \frac{3}{12} \times \frac{4}{100} = £1$$

In practice, the time is always reckoned *in days*, and allowance is

made for days of grace in the case of bills payable in this country or in any other country where days of grace are allowed (see Chapter II).

Example 1.—A bill for £885 drawn on 12th January, 1933, at four months date, is discounted on 2nd March, 1933, at 3 %. What is the amount of discount?

Solution:—

Allowing three days of grace, the bill is due on 15th May.
From 2nd March to 15th May is 29 + 30 + 15 = 74 days.

$$\therefore \text{ Bankers' discount} = £885 \times \frac{74}{365} \times \frac{3}{100}$$
$$= \underline{£5\ 7s.\ 8d.}$$

Example 2.—What is the face value of a bill drawn at 60 days date if bankers' discount at $2\frac{1}{2}$ % is £5 5s. 0d.?

Solution:—

$$\text{Face value} \times \frac{2\frac{1}{2}}{100} \times \frac{63}{365} = £5\frac{1}{4}$$
$$\therefore \text{ Face value} = \frac{21}{4} \times \frac{365}{63} \times \frac{200}{5}$$
$$= \underline{£1216\ 13s.\ 4d.}$$

From the foregoing, the following relationships will be clear:

BANKERS' DISCOUNT = INTEREST ON FACE VALUE.

TRUE DISCOUNT = INTEREST ON TRUE PRESENT WORTH.

∴ BANKERS' DISCOUNT — TRUE DISCOUNT = INTEREST ON (FACE VALUE — TRUE PRESENT WORTH) = INTEREST ON TRUE DISCOUNT.

This difference between bankers' discount and true discount is sometimes known as BANKERS' GAIN.

Example 3.—A banker has the alternative of placing £200,000 on deposit with an agent for three months at 4 % per annum, or investing the same amount in three months bills at the same rate of discount. Which is the better proposition, and what does the banker gain by choosing it?

Solution:—

$$\text{Interest on the deposit} = £\frac{200000}{1} \times \frac{3}{12} \times \frac{4}{100} = £2000$$

If the banker invests in bills, every £100 bill costs him

$$100 - 100 \times \frac{4}{100} \times \frac{3}{12} = £99$$

$$\therefore \text{ For £200,000 banker gets } £\frac{200000}{99} \text{ in bills}$$
$$= \underline{£202{,}020 \cdot 20}.$$

Thus his investment in bills yields him £2020·2.

$$\therefore \text{ His gain by discounting} = \underline{\pounds 20\ 4s.}$$

$$\text{or about } \frac{20{\cdot}20 \times 100}{200000} = {\cdot}01\ \% \text{ per three months,}$$

$$\text{i.e., } \underline{{\cdot}04\ \% \text{ per annum.}}$$

Example 4.—The bankers' discount on a bill of exchange due in four months' time is £5 2s. 0d. The true discount on a sum of money due in the same time at the same rate is £5. What is the rate of discount and the face value of the bill? (Work in months and neglect days of grace.)

Solution:—

Since Bankers' Discount — True Discount = Interest on True Discount,

$$\therefore \text{ 2s.} = \text{Interest on £5 for 4 months.}$$

$$\therefore \pounds\frac{1}{10} = 5 \times \frac{4}{12} \times r$$

$$\therefore \text{ Rate of discount} = \underline{6\ \%}.$$

Since Bankers' Discount = Interest on Face Value,

$$\pounds 5\frac{1}{10} = \frac{6}{100} \times \frac{4}{12} \times \text{F.V.}$$

$$\therefore \text{ Face Value} = \underline{\pounds 255.}$$

Equation of Payments.—It is frequently necessary in practice to determine *what sum of money* can be paid on a specified date, or alternatively *when* a specified sum of money can be paid, in order to discharge several debts falling due for payment at different future times. Thus a merchant who has several bills falling due for payment in the future may offer to discharge them all on a specified date by payment of an equivalent sum of money allowing for interest, or to discharge them all by a single payment on a date which would mean no loss either to him or to the creditor. This date is known as an *Equated Date*, and the process of finding it is known as the *Equation of Payments*.

The method is to multiply each sum to be paid (or the face value of each bill, if bills are involved) by the days which have to elapse before the payment is due, and then to divide the sum of the products so obtained by the sum of the payments (or the sum of the face values in the case of bills).

In calculating the period we must count from the same date for each of the payments. For this purpose we fix on any convenient date as the *zero date*, and add or subtract the resultant products as the case may be.

Example 1.—What is the equated date of the following bills:

£200 drawn on 14th March at 3 months date;
£300 drawn on 5th April at 2 months date;
£500 drawn on 14th April at 4 months date?

Solution:—

(*a*) Take 14th March, date of first bill, as the zero date.

∴ £200 (1st bill) falls due on 17th June, i.e., 95 days after 14th March.
£300 (2nd bill) falls due on 8th June, i.e., 86 days after 14th March.
£500 (3rd bill) falls due on 17th August, i.e., 156 days after 14th March.

£1000

∴ These payments are equivalent to one payment of £1000 made in

$$\frac{(200 \times 95) + (300 \times 86) + (500 \times 156)}{1000}$$ days from 14th March

$$= 122 \cdot 8 \text{ days.}$$

∴ To nearest day the equated date is 15th July.

(In practice, the calculation should be set out as shown below.)

(*b*) Take 8th June, due date of second bill (i.e., the *earliest* maturity), as the zero date.

Amount. £	Date Drawn.	Due Date.	No. of Days.	Product.
200	14th March	17th June	9	1800
300	5th April	8th June	0	0
500	14th April	17th August	70	35000
£1000				36800

$$\frac{36800}{1000} = 36 \cdot 8$$

Say, 37 days from 8th June.

Equated date = 15th July.

If we take a zero date which is *later* than the due date of any of the payments the products corresponding to those payments must be *deducted* from the full total.

Example 2.—A customer has accepted the following bills:—

£250 at three months from 3rd March.
£200 at two months from 5th April.
£600 at four months from 14th April.

If discount is 4 % per annum, what sum paid on 1st June will clear the whole debt?

Solution:—

Take 1st June as the zero date:—

£250 (1st bill) is due on 6th June, i.e., 5 days after 1st June.
£200 (2nd bill) is due on 8th June, i.e., 7 days after 1st June.
£600 (3rd bill) is due on 17th August, i.e., 77 days after 1st June.

£1050

If payment is made on 1st June, the banker must allow 4 % discount on £250 for 5 days, £200 for 7 days and £600 for 77 days:—

$$\begin{aligned} 250 \times 5 &= 1250 \\ 200 \times 7 &= 1400 \\ 600 \times 77 &= 46200 \\ &\underline{48850} \end{aligned}$$

$$\text{Discount on £48850 for 1 day @ 4 \%} = £\frac{48850 \times 4}{365 \times 100}$$

$$= £5\ 7s.\ 1d.$$

$$\therefore \text{ Sum to be paid} = £1050 - £5\ 7s.\ 1d.$$

$$= \underline{£1044\ 12s.\ 11d.}$$

If, as often happens, a banker has to discount a parcel of bills of different quality which are discountable at different rates, the deductions for discount must be calculated independently for each bill, and the necessary allowances made for stamp duty.

Example 1.—What amount would a banker credit his customer on 14th April for the following bills if all the bills are subject to English stamp duty and the current rates are:—

MARKET RATES:—

60 days bankers' drafts	$\frac{7}{8}$ %
3 mos. bankers' drafts	$\frac{15}{16}$ %
4 mos. bankers' drafts	1 %
1 month trade bills	2 %

£200 accepted 16th March, @ 2 mos. due 19th May, Accepted Acme Cycle Co. Ltd.
£300 accepted 5th April, @ 3 mos. due 8th July, Accepted Lloyds Bank.
£500 accepted 14th April, @ 4 mos. due 17th August, Accepted Lazards.

Solution:—

14th *April.*

Bill. £ s. d.	Days.	Rate.	Discount. £ s. d.
200 0 0	35	2 %	0 7 8
300 0 0	85	$\frac{15}{16}$ %	0 13 1
500 0 0	125	1 %	1 14 3
£1000 0 0			2 15 0
Less 3 5 0		Stamps	0 10 0
£996 15 0		Total Charges	£3 5 0

Amount credited to customer: £996 15s. 0d.

CHAPTER XXV

MONETARY UNITS AND SYSTEMS OF THE PRINCIPAL COUNTRIES—SIMPLE EXCHANGES

THE table on pages 584–5 gives particulars of the monetary units of the principal countries of the world. To assist the reader, the Mint Pars of Exchange with this country are given in sterling and also in currency in the case of those countries which are normally on a gold standard. In the following paragraphs brief details are given of the monetary systems of the more important States.

Fineness.—It is necessary to explain that by "fineness" is meant the proportion of pure metal in standard currency units. Our gold currency is $\frac{11}{12}$ths (or ·917) fine, which means that every 12 parts of standard gold from which sovereigns are made contain 11 parts of pure gold and 1 part of alloy. The standard gold of most other nations is $\frac{9}{10}$ths, ·900, or 900 fine, that is to say, there are 900 parts of pure gold in every 1,000 parts of the currency metal, so that our standard gold is of purer quality than that of most other countries. The reader will observe that it does not matter whether the parts are grains, ounces, pounds, or grammes—the fineness or proportion of pure gold is expressed in the same way.

MONETARY SYSTEMS OF THE PRINCIPAL COUNTRIES.

Great Britain.

4 farthings = 1 penny. 12 pence = 1 shilling.

20 shillings = 1 pound.

40 lbs. troy of standard gold, $\frac{11}{12}$ths fine, are coined into 1,869 sovereigns.

1 sovereign weighs 123·27447 grains, or 7·98805 grammes, of standard gold.

1 sovereign contains 113·0016 grains, or 7·322381 grammes, of *fine* gold.

1 lb. troy = 12 ozs. 1 oz. troy = 480 grains = 31·1035 grammes.

Country.	Monetary Units.	Mint Par of Exchange.		Type of Standard.
		Currency.	£ s. d.	
GREAT BRITAIN	Sovereign (= 20 shillings = 240 pence)	—	—	Gold bullion†
BRITISH EMPIRE.				
Aden (*see* India)	—	—	—	—
Australia ..	Pound (= 20s. = 240d.)	1	1 0 0	Gold bullion†
British Honduras	Dollar (= 100 cents)	4·8665	0 4 1½	Sterling exchange
British North Borneo	S.S. dollar (= 100 cents)	8·57	0 2 4	Gold exchange
Canada ..	Dollar (= 100 cents)	4·8665	0 4 1·32	Gold bullion*
Ceylon ..	Rupee (= 100 cents)	13·33	0 1 6	(*See* India)
Cyprus ..	Pound (= 180 piastres)	1	1 0 0	Sterling exchange
Hong Kong and Labuan	Dollar (= 100 cents)	—	—	Silver
India ..	Rupee (= 16 annas = 64 pice = 192 pies)	13·33	0 1 6	Sterling exchange
Iraq	Dinar (= 1,000 fils)	1	1 0 0	Sterling exchange
Irish Free State	Pound (= 20s. = 240d.)	1	1 0 0	Sterling exchange
Jamaica ..	Pound (= 20s. = 240d.)	1	1 0 0	Sterling exchange
Kenya, Tanganyika and Uganda	Shilling (= 100 cents)	20	0 1 0	Sterling exchange
Malaya (*see* Straits Settlements)	—	—	—	—
Malta	Pound (= 20s. = 240d.)	1	1 0 0	Sterling exchange
Mauritius and Seychelles (*see* India)	—	—	—	—
Mesopotamia (*see* Iraq)	—	—	—	—
Newfoundland	Dollar (= 100 cents)	4·8665	0 4 1·32	Gold bullion*
New Zealand	Pound (= 20s. = 240d.)	1	1 0 0	Gold bullion†
Palestine ..	£P (= 1,000 millièmes)	1	1 0 0	Sterling exchange
Rhodesia ..	Pound (= 20s. = 240d.)	1	1 0 0	Gold specie†
Straits Settlements	Dollar (= 100 cents)	8·57	0 2 4	Gold exchange†
Sudan (*see* Egypt)	—	—	—	—
Union of South Africa	Pound (= 20s. = 240d.)	1	1 0 0	Gold specie†
West Africa ..	Pound (= 20s. = 240d.)	1	1 0 0	Sterling exchange
EUROPE.				
Latin Standard[1]				
Albania	Lek (= 20 centimes)			Gold specie and gold exchange*
	Franc (= 100 centimes)			—
Latvia ..	Lat (= 100 graschi or santimes)	25·2215	0 0 9·516	Gold bullion*
Spain ..	Peseta (= 100 centimos)			Inconvertible paper
Switzerland	Franc (= 100 centimes)			Gold bullion
Scandinavian Standard[2]				
Denmark	Krone (= 100 öre)			Gold bullion†
Esthonia ..	Kroon (= 100 sents)			Gold exchange†
Norway ..	Krone (= 100 öre)	18·1595	0 1 1½	Gold bullion†
Sweden ..	Krona (= 100 öre)			Gold bullion†
Austria ..	Schilling (= 100 groschen)	34·58½	0 0 7	Gold exchange*
Belgium ..	Belga (= 5 francs = 500 cents)	35·00	0 0 6·858	Gold bullion
Bulgaria ..	Leva (= 100 stotinki)	673·659	0 0 0⅓	Gold exchange*
Czecho-Slovakia	Krone (= 100 heller)	164·25¼	0 0 1½	Gold exchange*
Dantzig ..	Dantzig gulden(=100D.pf)	25	0 0 9·6	Gold exchange*
Finland ..	Markka (= 100 penni)	193·23	0 0 1¼	Gold exchange†

* Not effective. † Suspended.

[1] Including countries which have adopted the same system of currency as the now abandoned Latin Union.

[2] Including countries which have the same system as the defunct Scandinavian Union.

Country.	Monetary Units.	Mint Par of Exchange.		Type of Standard.
		Currency.	£ s. d.	
EUROPE—(*cont.*)				
France ..	Franc (= 100 centimes)	124·2134	0 0 1·932	Gold bullion
Germany ..	Rmark. (= 100 pfennige)	20·429	0 0 11·748	Gold bullion*
Greece ..	Drachma (= 100 lepta)	375	0 0 0·64	Gold exchange†
Holland (Netherlands)	Florin (= 100 cents)	12·107	0 1 7·824	Gold bullion
Hungary ..	Pengö (=100 filler or garas)	27·825	0 0 8·62	Gold exchange*
Italy	Lira (= 100 centesimi)	92·46	0 0 2·6	Gold exchange (*a*)
Lithuania ..	Litas (= 100 cents)	48·665	0 0 4·932	Inconvertible paper (*a*)
Luxembourg	Franc (=80 pfennige)	175·00	0 0 1·371	Gold exchange
Poland ..	Zloty (= 100 grosz)	43·38	0 0 5·5	Gold bullion and gold exchange*
Portugal ..	Escudo (= 100 centavos)	110	0 0 2·182	Sterling exchange
Rumania ..	Leu (= 100 bani)	813·6	0 0 0·3	Gold exchange*
Turkey ..	Pound, T£1 (=100 piastres = 4,000 paras)	110·71 (piastres)	0 18 1	Inconvertible paper
U.S.S.R. ..	Tchervonetz (=10 roubles)	0·946	1 1 1¾	Inconvertible paper
Yugo-Slavia ..	Dinar (= 100 paras)	276·32	0 0 0·87	Gold exchange*
AMERICA.				
Argentina ..	Peso (= 100 centavos)[1]	5·05	0 3 11½	Sterling exchange
Bolivia ..	Boliviano (=100 centavos)	13·33	0 1 6	Gold bullion†
Brazil ..	Milreis (= 100 centavos = 1,000 reis)	40·7	0 0 5·899	Gold bullion†
Chile	Peso (= 100 centavos)	40	0 0 6	Gold bullion†
Colombia ..	Peso (= 100 centavos)	5	0 4 0	Gold bullion (*b*)
Costa Rica ..	Colon (= 100 centesimos)	10·45	0 1 10·9	Gold bullion*
Cuba	Marti (= $20 U.S.)	0·2433	4 1 8·64	Dollar exchange*
	Peso (= 100 centavos = $1 U.S.)	4·8665	0 4 1·32	
Ecuador ..	Sucré (= 100 centavos)	24·33	0 0 10	Gold bullion†
Guatemala ..	Quetzal (= 60 pesos)	4·8665	0 4 1·32	Dollar exchange
Haiti (Dominica)	Gourde (= 100 centavos)	—	0 0 9·87	Stabilised at 1 gourde = $·20 U.S.
Honduras ..	Lempira (=100 centavos)	9·733	0 2 0·66	Gold exchange†
Mexico ..	Peso (= 100 centavos)	9·76	0 2 0½	Gold exchange†
Nicaragua ..	Cordoba (=100 centavos)	4·8665	0 4 1·32	Gold exchange†
Panama ..	Balboa (=100 centesimos)	4·8665	0 4 1·32	Gold exchange†
Paraguay ..	Peso (= 100 centavos)	5·113	0 3 11½	Inconvertible paper
Peru	Sol (= 100 centavos)	17·38	0 1 1·81	Gold bullion†
Salvador ..	Peso or colon (= 100 centavos)	9·73	0 2 0·6	Gold exchange†
United States	Dollar (= 100 cents)	8·24	0 2 8·54	Gold bullion†
Uruguay ..	Peso (= 100 centesimos)	4·67	0 4 3	Inconvertible paper
Venezuela ..	Bolivar (= 100 centavos)	25·2215	0 0 9½	Gold bullion†
ASIA.				
China	Shanghai dollar (= 100 cents)	—	—	Silver
Dutch E. Indies	Guilder (= 100 cents)	12·107	0 1 7·824	Gold exchange
Indo China ..	Piastre (= 10 francs)	12·42134	0 1 7·32	Gold exchange
Japan ..	Yen (= 100 sen)	9·76	0 2 0·582	Gold bullion†
Korea ..				
Persia ..	Riyal (= 100 dinars)	20	0 1 0	Gold bullion*
Philippines ..	Peso (= 100 centavos)	9·733	0 2 0·66	Dollar exchange
Siam	Tical or baht (= 100 satangs)	11	0 1 9·82	Gold exchange†
AFRICA.				
Algeria ..	Franc (= 100 centimes)	124·2134	0 0 1·932	Gold bullion
Belgian Congo	Franc (= 100 centimes)	175·00	0 0 1·371	Gold exchange
Egypt ..	Pound (= 100 piastres)	97½ pia.	1 0 6¼	Gold bullion†
Liberia ..	U.S. dollar (= 100 cents)	(See United States)		
Madagascar ..	Franc (= 100 centimes)	124·2134	0 0 1·932	Gold exchange
Morocco (French)	Franc (= 100 centimes)	124·2134	0 0 1·932	Franc exchange
Morocco (Spanish)	Peseta (= 100 centimes)	25·2215	0 0 9·516	Peseta exchange
Tripoli ..	Lira (= 100 centesimi)	92·46	0 0 2·6	Gold exchange
Tunis ..	Franc (= 100 centimes)	124·2134	0 0 1·932	Gold exchange

* Not effective. † Suspended.

(*a*) Exchanges pegged. (*b*) Pegged exchange at 105 pesos = $1 U.S.

[1] Quotations are for gold pesos. To convert the quotation to paper pesos, multiply by $\frac{44}{100}$.

According to the Coinage Act, 1891, 1,869 sovereigns are to be coined out of 40 lbs. troy of gold, $\frac{11}{12}$ths fine, and a new sovereign should therefore weigh 123·27447 grains, but a remedy allowance is permitted of ·4 of a grain or *three* parts per mille more or less than this legal weight, and of *two* parts per mille in the fineness. Sovereigns cease to be legal tender when they weigh less than 122½ grains and half-sovereigns when less than 61⅛ grains. The gold coins issued by the mints at Pretoria, Sydney and Melbourne are legal tender here, and the English gold coins are also legal tender in Australia.

Since the passing of the Gold Standard Act, 1925, all gold for coinage must pass to the Mint from the Bank of England, which is compelled by its charter to buy all gold offered to it at the price of £3 17s. 9d. per oz. standard. By the same Act, the Bank was required to sell gold at the rate of £3 17s. 10½d. per ounce standard, provided the amount demanded was not less than 400 ounces troy of fine gold (about £1,700), but this obligation was suspended by the Gold Standard (Amendment) Act, 1931.

Silver Coins.—The common silver coins are the crown, half-crown, florin, shilling, sixpence and threepenny piece. Up to 1920, 66 shillings were coined out of one troy pound weight of silver $\frac{37}{40}$ths fine, but the silver coins issued since that year are only 500 or $\frac{20}{40}$ths fine. The coins are made of an alloy of silver with nickel, copper and zinc, and, as the value of the metal from which they are made is much below the face value of the coins, the Government makes a considerable profit on their issue.

Bronze Coins.—The bronze coins (95 parts copper, 4 parts tin, 1 part zinc) are the penny, half-penny and farthing. Legally, 48 pennies must weigh 1 lb. avoirdupois of bronze, or one penny weighs nearly 146 grains; two half-pennies, however, weigh 175 grains.

Bank of England Notes are issued by the Bank of England for amounts of 10s., £1, £5, £10, £20, £50, £100 and upwards. The 10s. and £1 notes were first issued in 1928 to replace the Treasury notes of similar denomination issued by the Government during and after the Great War under the Currency and Bank Notes Act, 1914.

Legal Tender Currency :—

(1) Bank of England notes are legal tender for any amount.
The Bank's 10s. and £1 notes are legal tender in England and Wales, Scotland and Northern Ireland for all purposes, including payment of the Bank's notes of higher denomination.

Bank of England notes for £5 and over are legal tender in England and Wales for payment of £5 or over, except by the Bank or its branches. The Bank's notes of £5 and upwards are not legal tender in Scotland or Northern Ireland.

(2) Gold coins are legal tender for any amount.

(3) Silver coins are legal tender up to 40s.

(4) Copper coins are legal tender up to 1s.

The silver and bronze coins are called *token* coins, as their commodity value is in normal times less than their face value. The limit on the amounts for which they are legal tender keeps other more valuable forms of currency in circulation.

The British Empire.—*Australia.*—The monetary system and standard are identical with those of Great Britain, the coins of gold, silver, and bronze issued by the Commonwealth corresponding in value, weight and fineness with those issued by this country, except that the silver coins are of our old fineness, ·925, and that no silver coin above 2s. 0d. is issued. The gold coins are identical with our own, but the silver and bronze coinage is of special design. English coins circulate side by side with the Commonwealth issues.

Notes of various denomination are issued by the Commonwealth Government through the Commonwealth Bank, the central banking institution. The circulation of gold coins has been suspended in Australia as in Great Britain. Owing to financial difficulties in 1930, gold exports from Australia were also suspended, and the Australian pound has depreciated by about 25 % in terms of sterling.

British West Africa.—British notes and gold coins circulate in the Colonies grouped under this heading, together with notes of small denomination and token coins of bronze and silver, issued by the West African Currency Board.

Canada. 1 dollar = 100 cents.

Normally, the standard is gold, based on the legal rate of $\$4\cdot86\frac{2}{3}$ = £1, or \$1 = 4s. 1·32d. Silver coins of 1 dollar, 50, 25, 10, 5 cents and various smaller tokens of nickel and bronze are issued. The English sovereign and American eagle of 10 dollars are both legal tender to any amount and circulate freely, the eagle being accepted as equivalent to 10 Canadian dollars. The paper currency consists of notes of various denomination issued by the Government and the Canadian banks.

The Canadian authorities continue to insist that Canada is still

on a gold standard; but, in view of the depreciation of her currency and the restriction of gold exports, it is difficult to see how this claim can be justified.

Ceylon. 1 rupee = 100 cents.

The standard is the Indian rupee (see below). The coinage consists of silver coins of 10, 25 and 50 cents, nickel coins of 5 cents, and copper coins of 1, $\frac{1}{2}$ and $\frac{1}{4}$ cent. Currency notes of various denomination in rupees are also issued by the local administration.

India. 1 rupee = 16 annas.

1 anna = 4 pice. 1 pice = 3 pies.

1 lac or lakh of rupees * = 100000 rupees (written Rs. 1,00,000).

1 crore of rupees = 10,000,000 rupees (do. Rs. 1,00,00,000).

Note: 12,11,07,250 rupees = 12 crores, 11 lacs, 7250 rupees. Rx. = 10 rupees. Rx. 7,99,00,00 = 79,900,000 rupees.

The standard coin is the silver rupee of 180 grains troy, $\frac{11}{12}$ths fine, and $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$ of the same weight and fineness are called 8-, 4-, 2-anna pieces respectively. The minor coinage consists of nickel coins of 1, 2, 4 and 8 annas, and bronze coins of $\frac{1}{2}$ anna and 1 pice ($\frac{1}{4}$ anna).

The rupee is legal tender for any amount, and, since March, 1927, its gold value is fixed for purposes of conversion at 8·47512 grains pure gold, i.e., 13·33 rupees = 1 sovereign, or 1 rupee = 18d. Between March 1920 and 1927 the sovereign was legal tender in India at the rate of £1 = 10 rupees, but it is now demonetised.

By the Act of 1927, the currency authority was compelled by law to buy gold, and to sell gold (or gold exchange at its option) at the fixed price of 18d. per rupee; but following the suspension of the gold standard by Great Britain, the rupee continued to be linked to sterling at the fixed rate of 18d.; i.e., a "*sterling exchange standard*" was adopted and the value of the rupee was allowed to depreciate in terms of gold. Only the Imperial Bank of India and other specially appointed banks are allowed to deal in foreign exchange.

Irish Free State.—Up to the end of 1928 the circulating media consisted of British coins, Treasury notes, and Irish bank notes issued by the various Irish banks under the Bank Charter (Ireland) Act, 1845. As from the beginning of 1929 the circulating media were replaced by new Irish token currency authorised by the Irish Coinage Act, 1926, and by notes issued under the provisions of the Irish Cur-

* The term "lac" is also used on the London Foreign Exchange Market to signify "one hundred thousand" in connection with other currencies, e.g., "1 lac yen" = 100,000 yen.

rency Act, 1927, in denominations of the *Saorstaat Pound*, the unit of account. The token coinage consists of silver coins, 750 fine, of 2s. 6d., 2s. and 1s.; nickel coins of 6d. and 3d., and bronze coins of 1d., ½d. and ¼d.

The notes in circulation are of two classes:—

(1) LEGAL TENDER NOTES, issued by the Irish Currency Commission to the banks against the deposit of gold, British currency, British Government securities, or sight drafts on London. The notes are redeemable in sterling on demand if presented at the London agency of the Commission.

(2) CONSOLIDATED BANK NOTES, issued by recognised banks, and obtained by them from the Currency Commission against the deposit of cash or against the security of trade bills or acceptable evidence of advances granted by the banks. These notes are convertible into legal tender at the Head Offices of the issuing banks.

The free convertibility of Irish currency into sterling forms the basis of the *sterling exchange standard* which has been adopted as a means of ensuring that no exchange difficulties shall disturb the trade relationships between the two countries.

There are no legal restrictions on foreign exchange, but the banks exercise strict control.

New Zealand.—The currency of New Zealand consists of English coins of gold, silver and bronze, together with notes of various denomination issued by the Bank of New Zealand and certain of the Australian banks.

In 1933, New Zealand's industrial position became so adverse that the Government had to intervene and devalue the exchange on the basis of £125 New Zealand per £100 sterling. The six leading banks maintain the exchanges at this level, but there is also an unofficial market.

The Sudan.	1 piastre (= 10 millièmes) = 40 paras.
	1 Egyptian pound = 100 piastres.

The gold coins are the Egyptian pound (£E), value 20s. 6d., and the 50-piastre piece of half the value of the £E. The English sovereign is legal tender at 97·50 piastres. Gold coins are not at present issued, the circulating medium consisting of notes.

Silver coins of 1, 2, 5, 10 and 20 piastres, and also several smaller nickel and bronze coins, are issued.

The Union of South Africa.—The monetary system is the same as that of Great Britain, the South African pound being the standard of value. Early in 1924 a new silver coinage of special design was issued to replace the English and the old Kruger silver coins in circulation. The silver coins are 800 fine.

Notes of various denominations are issued by the South African Reserve Bank, and these are gradually superseding the issues previously made by the various other South African banking institutions.

In view of South Africa's vast gold production, it is not surprising that gold coins continued to circulate in the Union long after they had disappeared in other countries, and that the nation was very loth to follow Britain's lead in 1931 and suspend the gold standard. Actually, this was not done until December, 1932, when bank notes were made inconvertible into gold and exports of the metal were controlled.

The South African banks (like the banks in the other Dominions) have a virtual monopoly of all exchange dealings, rates being fixed by agreement between them. There is, however, a private unofficial market where it is possible to deal at cheaper rates than the official rates. This market consists of large firms with connections in the Dominions and certain London banks outside the "Ring".

In March, 1932, a new coinage was decreed consisting of the *florin* (11·30016 grains of pure gold), the *cent* (1/100 of the value of the florin), and the *rand*, equal to a 10-florin gold piece; of silver coins of 2 florins, 1 florin and 50, 20 and 10 cents; and of bronze coins of the value of 4, 2 and 1 cents.

Rhodesia.—The monetary system is practically the same as that of the Union of South Africa, but the gold standard is not now in operation. Notes are issued by the various banks and no steps have been taken to centralise the issue.

EUROPE.

The Latin Standard.—In 1865, France, Italy, Belgium and Switzerland agreed to adopt a uniform monetary system, and for this purpose formed what was known as the *Latin Union*, which Greece joined later. The Union adopted a double or bimetallic standard of value, based on gold and silver, coins of either metal being made equally legal tender in their respective countries at the legal ratio of $15\frac{1}{2}$ of silver to one of gold. The arrangements provided that the monetary units or standard coins, although of different design and, if

desired, of different names, should all be of the same weight and fineness, and should contain approximately ·32258 gramme of gold, 900 fine, giving, in each case, a mint parity with British currency of 25·2215 per £1.

Owing to the great difficulty of maintaining the bimetallic ratio (see Chapter XVIII), the countries concerned had to demonetise silver, while, in consequence of currency difficulties arising from the Great War, the Union had to be dissolved.

Of the original participants only Switzerland still maintains a gold currency standard based on the weight and fineness adopted by the Latin Union. The same gold standard basis has, however, been adhered to in Spain since 1891, and has also been adopted by two of the new post-war European States (Latvia and Albania), each of which has, therefore, a currency whose Mint Par with sterling is nominally 25·2215 = £1.

The various countries whose currencies are now based on this standard, which, for convenience, we describe as the *Latin Standard*, are given below. As a rule, token coins of silver, nickel and bronze are issued by all these countries, but gold does not circulate and the currencies consist largely of paper money of various denomination.

Albania. 1 franc (franchi) = 5 lek = 100 centimes.

The franc contains ·290322 gramme of fine gold. Notes, issued by the National Bank of Albania, and silver, nickel and bronze coins circulate.

Latvia (Centre quoted: *Riga*).

1 lat = 100 santimes or graschi.

The currency of the post-war State of Latvia was based in August, 1922, on a monetary unit known as the *lat*, equivalent to the gold franc adopted by the old Latin Union, and thus containing ·32258 gramme of gold, 900 fine, or ·2903 gramme of pure gold.

Latvia is nominally on a gold bullion standard: but dealings in exchange are subject to such restrictions that the standard is no longer effective.

Spain (Centre quoted: *Madrid*).

1 peseta = 100 centimos.

1 peso duro or piastre = 5 pesetas.

Spain, as we have seen, adopted the same currency system as the now extinct Latin Union, her monetary unit, the *peseta*, having a mint

parity with the sovereign of 25·2215 pesetas per £1. The monetary system is still legally bimetallic, but in reality the legal tender silver 5-peseta pieces, weighing 25 grammes, 900 fine, form the basis of the currency. In addition to the new gold coins of 5, 10, 20 and 50 pesetas, various minor coins in silver and bronze are issued, but the currency consists chiefly of notes of various denominations issued by the Bank of Spain. The Bank's note issue up to 4 milliards of pesetas must be covered by 40 % gold and 5 % silver, but if the issue is between 4 and 5 milliards, the cover must be as to 50 % gold, and as to another 10 % silver.

In spite of her neutral position during the Great War, Spain, by reason of various internal difficulties, was unable to maintain the parity of the peseta with gold, although the depreciation was at no time very great. Spain has ample gold reserves; but attempts at monetary reform have been defeated by indecisive action, and, later, by political disturbances. There are as yet no prospects of a return to gold in the near future. All exchange dealings are rigidly controlled and at the time of writing the peseta is fairly closely linked to sterling.

Switzerland (Centre quoted: *Zurich* or *Geneva*).

1 franc = 100 centimes.

Switzerland, having remained neutral during the Great War, was able to maintain the gold standard throughout the period of hostilities. Nevertheless, the circulating currency, like that of other European countries, has for some years past consisted mainly of notes of various denomination, together with token coins of silver and nickel.

Early in 1929 an expert Committee, appointed by the Swiss Government to consider the currency position, recommended that the country should return to the full gold standard, and that the circulation of gold coins should be resumed. For the time being, however, the notes of the National Bank were made convertible, at its option, into gold coins, or gold in the form of bars, or *gold exchange*, i.e., a gold exchange standard was adopted. Later, on the location of the Bank for International Settlements at Basle in 1930, Switzerland instituted the gold *bullion* standard; but no further move has been made towards the re-establishment of a gold *specie* standard.

The Scandinavian Standard.

Norway (Centre quoted: *Oslo*).
Denmark (Centre quoted: *Copenhagen*). } 1 Krone = 100 öre.
Sweden (Centre quoted: *Stockholm*). 1 Krona = 100 öre.
Esthonia (Centre quoted: *Reval* or *Tallin*). 1 Kroon = 100 sents.

The Scandinavian Mint Convention was formed in 1873 between Denmark and Sweden, Norway joining afterwards.

The original arrangements provided that the gold coins, token coins and central bank notes of each country should be freely accepted in the other countries, and that the coin and note issues of the three countries should be interchangeable In consequence of the War, the arrangements broke down, and in 1924 the Convention was formally dissolved. In 1931–32, all three countries suspended the gold standard, and at the time of writing, their exchanges are controlled and maintained as closely as possible to a fixed value in terms of sterling. (See Chapter XIX.)

The gold coins legally provided for are 20-, 10-, and 5-kroner pieces, the Mint Regulations prescribing that one hundred and twenty-four 20-kroner pieces, 900 fine, must be coined from 1 kilogramme of fine gold, giving a Mint Par with Britain of 18·159 kr. per £1. Various bronze, nickel and silver coins, as well as notes issued by the respective central banks, are current.

The new post-war Baltic State Esthonia first adopted a standard unit known as the *mark*, having the same weight and fineness as the Swiss franc (i.e., the Latin standard). As a result of currency mismanagement much difficulty was experienced, and in January, 1928, the gold exchange standard was instituted based on the *kroon*. This was given the same metallic content as the Scandinavian currencies, viz., ·403226 gramme of pure gold, so that the mint parity with this country is the same as that of Norway, Sweden and Denmark, viz., 18·159 kroner per £1.

At first a gold exchange standard was maintained, but in June, 1933, Esthonia suspended the gold standard, and the kroon was linked to sterling. This meant a reduction of 35 % in the gold value of the kroon.

Austria (Centre quoted: *Vienna*).

1 schilling = 100 groschen.

The gold standard was adopted by the dual State of Austria-Hungary in 1892, the unit being the gold krone or corona, 3,280 kr. being coined from 1,000 grammes of *fine gold*.

In consequence of the War, the two countries separated under distinct Governments, and in both cases the currencies (and also the exchanges) became considerably depreciated. In 1925 Austria, with the assistance of the League of Nations, remodelled her currency on the basis of a new unit, the *schilling* of 100 groschen, which for purposes

of conversion was made equal to 10,000 paper kronen of the old currency. By the Mint Regulations, 1 kilogramme of fine gold is coined into 4,723·2 schillings. The 100-schilling piece thus contains 21·17 grammes of pure gold, and the mint parity with British currency is 34·58½ schillings per £1. New silver, nickel and copper tokens have been issued, but some larger coins of the old currency still pass as legal tender at fixed equivalents to the new coinage.

In 1931 dealings in foreign exchange were subjected to official control, the rates being fixed by the Austrian National Bank. But as from September, 1933, control has been relaxed and all private and external debts must be settled at the market exchange of the day.

Belgium (Centre quoted: *Brussels*).

1 belga = 5 francs = 500 centimes.

The currency of Belgium naturally depreciated considerably in value as a result of her participation in the War and of her close relationship with France. In October, 1926, steps were taken to remedy the position. A stabilisation loan was floated by the Belgian Government in London and New York, and the exchange was stabilised at the then prevailing rate of 175 Belgian francs per £1. For exchange purposes a new unit was introduced, known as the *belga*, but internal exchanges are still effected in terms of francs, five paper francs being taken as equivalent to one belga.

The belga is based on the equivalent of ·232456 gramme of gold, $\frac{9}{10}$ths fine, or ·209211 gramme of fine gold, making the Mint Par of Exchange with Great Britain 35 belgas per £1. No gold coins are at present in circulation, but the subsidiary coinage consists of various coins of nickel and cupro-nickel. The sole rights of issuing paper money are vested in the hands of the Banque Nationale de Belgique, which is compelled to maintain a reserve of at least 30 % in gold, and must redeem its notes in gold, in gold exchange, or in silver at its market value in terms of gold.

The gold exchange standard originally introduced on the stabilisation of the Belgian exchange functioned very successfully and has now been replaced by a gold bullion standard.

Bulgaria (Centre quoted: *Sofia*).

1 leva = 100 stotinki.

After several years of currency mismanagement and financial difficulty, Bulgaria appealed to the League of Nations for assistance with her programme of reconstruction. In 1926 a Refugee Loan was

raised under the auspices of the League, and in November, 1928, arrangements were finally made for the flotation of a Stabilisation Loan of £5,000,000 in London, New York and Paris. The proceeds of the loan were used to stabilise the leva at the new basis of 673·659 levas per £1, or 139 levas per dollar, and a form of gold exchange standard was instituted. Stability of the currency has been well maintained, but, as in most other countries, the exchanges are now subject to considerable restrictions.

The National Bank of Bulgaria is empowered to issue notes of denomination not less than 200 levas, while token coins of silver and baser metal are being issued to replace notes of lower value.

Czecho-Slovakia (Centre quoted: *Prague*).

1 crown or koruna = 100 heller or haleru.

This post-war State adopted the same system as that of Austria-Hungary in pre-war days, so that until February, 1929, it had a mint parity with this country of 24·02 per £1. In consequence of inflation and financial difficulty, the currency depreciated considerably in value, and steps had to be taken to stabilise it on a new basis. Credits were arranged by the Czecho-Slovak National Bank with certain of the principal central banks abroad, and the crown was given a new equivalent of ·04458 gramme of fine gold, giving a mint parity with with this country of 164·25¼ cr. per £1. The gold exchange standard instituted in 1929 is inoperative, stability of the exchanges being maintained by official control.

In March, 1934, faced with serious financial difficulties, Czecho-Slovakia sought relief in a further devaluation of her currency. The crown was devalued by one-sixth and its new gold content was fixed at ·03715 gramme of fine gold.

Dantzig. 1 florin or gulden = 100 pfennige.

The monetary unit of the Free City of Dantzig is the paper *gulden* of 100 pfennige, equal to ·292895 gramme of fine gold. The currency is a " managed " one consisting mainly of notes of the Dantzig Bank of 10, 25, 100, 500 and 1,000 florins. Its value was originally stabilised at 25 Dantzig gulden to the pound sterling, the Dantzig Bank being required to exchange its notes, not for gold, but for cheques on London at the outgoing specie point of 25·21 fl. per £1. At the lower or incoming specie point of 24·89 fl. per £1 the Bank issued cheques on Dantzig to the Bank of England in exchange for pounds sterling, thus keeping the exchange within the two limits fixed by law.

Following the suspension of the gold standard in Britain, Dantzig abandoned the sterling standard and linked its currency to gold. Exchange dealings are, however, subject to official control.

The units are always referred to as the *Dantzig* florin or gulden and the *Dantzig* pfennige to avoid confusion with the Dutch florin or gulden and the German pfennige.

Finland (Centre quoted: *Helsingfors*).

1 markka (Finnish mark) = 100 penni.

In December, 1925, Finland devalued her monetary unit, the mark, which was instituted on the formation of the State after the War, and established the convertibility into gold of the notes of the Bank of Finland on the basis of 1 new mark = $\cdot 03\frac{15}{19}$ gramme of pure gold, or ·0421053 gramme of gold, 900 fine. This gives a mint parity with this country of 193·23 Finnish marks per £1. The gold standard was suspended in October, 1931, and Finnish currency has since depreciated considerably in terms both of sterling and of gold.

France (Centre quoted: *Paris*).

1 franc = 100 centimes.

France was the principal participant in the now defunct Latin Union, and from 1865 to the time of the Great War her currency was based on the gold *franc*, which had a mint parity with the sovereign of 25·2215 francs = £1. In addition the silver 5-franc piece, 900 fine, circulated as legal tender at the fixed rate of 15½ silver francs = 1 gold franc, France thus having a dual or bimetallic standard. When silver was cheap the 5-franc pieces were worth more in all markets as currency than they were worth as silver bullion, and as a consequence the system completely broke down, being consequently described as the *étalon boiteux*, or " limping standard".

During the Great War vast quantities of inconvertible notes were issued by the Bank of France, and by the Chambers of Commerce in the principal towns, with the result that the currency became very heavily depreciated. The inflation was continued after the War, until in July, 1926, the franc was quoted in the foreign exchange market as high as 250 to the £1, although there was evidence that this rate was considerably below the true value of the currency.

In December, 1926, a new Government undertook the reorganisation of the financial and currency position, and as a result the Paris rate on London was stabilised from March, 1927, to June, 1928, at 124 francs per £1, and, in the latter month, stabilisation *de facto*

became stabilisation *de jure* when the currency was devalued and a gold bullion standard established.

The franc has now a nominal gold content of 65·5 milligrammes, $\frac{9}{10}$ths fine, or 58·95 milligrammes fine, giving a Mint Par with Great Britain of 124·2134 francs per £1. One hundred-franc gold pieces are to be minted, and are constituted legal tender for any amount, but it is unlikely that these coins will circulate to any extent. Provision was also made for the issue of 5- and 10-franc silver pieces to replace the notes of lower denomination, and also for smaller token coins of aluminium-bronze, nickel and bronze. All gold and silver coins existing before the new currency law are no longer legal tender.

The Bank of France, which has the sole right of note issue, is required to redeem its notes in gold on demand in minimum quantities agreed from time to time between the Minister of Finance and the Bank. The effect is that gold is available for export in quantity, but is not issued for internal use. The Bank is compelled to maintain a gold reserve of not less than 35 % of its liabilities against notes and current accounts, the laws under which it was previously allowed a certain maximum circulation being now repealed. Owing to its policy of sterilisation, the Bank's gold reserve is now much above the legal minimum.

Germany (Centre quoted: *Berlin*).

1 reichsmark = 100 pfennige.

The gold standard was adopted in 1871, and gold coins of 10 and 20 marks were issued, all 900 fine. As a result of the War, however, Germany was compelled to depart from the gold standard, and, in consequence of vast issues of inconvertible paper, her currency became valueless and her exchange purely nominal. The reorganisation of the currency proceeded by two stages. In the first place *rentenmark* notes were issued and made current at the rate of 1 rentenmark = 1 billion marks of the pre-war currency. The rentenmark is now replaced by the *reichsmark* (= 100 pfennige) of equal value. Notes of various denominations in this new currency have been issued, together with a new coinage of silver and subsidiary metal tokens, all other coins previously issued having been demonetised.

The Mint Regulations provide that one kilogramme of fine gold is to be coined into 139½ 20-reichsmark pieces, or into 279 10-reichsmark pieces, all 900 or $\frac{9}{10}$ths fine.

Following the financial upheaval of 1931, Germany found it neces-

sary to place close restrictions on exchange operations, and, though the gold bullion standard continues to be maintained in theory, it is practically inoperative.

Greece (Centre quoted: *Athens*).

1 drachma = 100 lepta.

Until 1928 the monetary system of Greece was based on the bimetallic standard adopted by the Latin Union, but in May of that year, after a long period of inflation and depreciation, the currency was stabilised at the ruling rate of 375 per £1, or 51,212·87 drachmae per 1,000 grammes of fine gold.

Greece suspended the gold standard in 1932, and exchange dealings are now subject to considerable restrictions.

Holland (Centre quoted: *Amsterdam*).

1 florin or gulden = (19·82 pence) = 100 cents.

1 florin or gulden = 20 stivers.

Before 1875 the standard was silver, but, owing to the rapid fall in the value of this metal, the coinage of silver was temporarily suspended, and gold coins were put into circulation.

The standard coin is the 10-florin piece, weight 6·720 grammes, 900 fine, containing 6·048 grammes of fine gold. The currency in Holland is, therefore, based on the gold standard, with the silver coins issued before 1875 as limited legal tender.

During the Great War, practically no gold coins were in circulation in Holland, the currency consisting of paper money of various denomination, together with the silver coins and small tokens of nickel and bronze. In consequence of her neutrality during the Great War, however, and her favourable position as a link between Continental countries and the rest of the world, Holland benefited considerably and absorbed more gold than she needed. In 1925 the National Bank sought to re-establish the circulation of gold, but the attempt had to be abandoned because the gold coins soon disappeared.

At the time of writing, Holland continues successfully to maintain the gold bullion standard mainly because her balance of trade keeps firmly in her favour.

Hungary (Centre quoted: *Budapest*).

1 pengö = 100 filler or garas.

On her severance from Austria after the Great War, Hungary found herself with a currency which was severely depreciated in conse-

quence of the excessive issue of inconvertible paper. The paper *corona* was stabilised for some time at the rate of 346,000 per £1, but in November, 1925, a new unit was introduced known as the *pengö*, equal to 12,500 coronas.

Under the terms of the Currency Act, 3,800 pengö are coined from one kilogramme of fine gold, so that the Mint Par with sterling is 27·825 pengö per £1. Gold coins are not in circulation, the metallic currency in use consisting of token coins of silver, nickel and bronze.

The National Bank of Hungary has now the sole right to issue paper currency, and is charged with maintaining the stability of the monetary unit on the basis of a *gold exchange standard*. Thus the Bank must buy and sell such foreign currency as is necessary to keep the exchange within the two theoretical gold points between Hungary and other gold standard countries, and is compelled to buy gold bullion at the mint price of 3,800 pengö per kilogramme of fine gold, less six pengö minting charges, i.e., at 3,794 pengö per kilogramme.

Although a gold exchange standard is nominally operative in Hungary, exchange dealings are now greatly restricted, and, when permitted, can take place only at " official " rates.

Iceland (Centre quoted: *Reykjavik*).

1 krona (pl. *kronur*) = 100 aurar (sing. *eyrir*).

Prior to 1929, Iceland was a member of the Scandinavian Monetary Union, her currency having a mint parity with sterling of 18·159 kronur per £1. During and after the War, the krona was subject to wide fluctuations, but since October, 1925, its value has been maintained at the rate of 22·15 kronur per £1.

Since 1914, Iceland has been off the gold standard, and dealings in foreign exchange are now subject to official control.

Italy (Centre quoted: *Milan*).

1 lira = 100 centesimi.

On the establishment of the Latin Union, Italy based her currency on the *lira*, which, like the Swiss franc and the old French franc, had a parity with British currency of 25·2215 francs per £1. In common with other European countries, Italy entered during the Great War on a period of violent inflation, and excessive issues of inconvertible notes sent down the value of the lira to about $\frac{1}{6}$th of its pre-war value. After a period of great fluctuation, stabilisation was achieved in December, 1927, and a *gold exchange standard* was adopted based on the

paper lira. This was devalued on the basis of 7·919053 grammes of fine gold per 100 paper lire, giving a new parity with Great Britain of 92·46 lire per £1 and 19 paper lire per American dollar.

The metallic currency now consists of silver coins of 20, 10 and 5 lire, together with nickel and bronze tokens of lower denomination. The sole right of issuing paper currency is vested in the Banca d'Italia, which is compelled to hold reserves in gold or gold exchange of not less than 40 % of its notes outstanding and sight liabilities, subject, however, to the power to lower the percentage reserve in emergency on payment of a graduated tax.

There are at present no *official* restrictions on exchange operations in Italy, but the authorities, in conjunction with the leading banks, have been able successfully to "peg" the exchange rates and to maintain the gold bullion standard.

Lithuania (Centre quoted: *Kaunas* or *Kovno*).

1 litas (Engl. *lit.*) = 100 cents.

The new monetary unit of Lithuania, termed the *litas*, was made equivalent to $\frac{1}{10}$th of the pre-1933 U.S. gold dollar, giving it a gold value of ·150462 gramme of pure gold. Coins of silver and nickel are also issued, together with notes of the Bank of Lithuania for various amounts.

No rights exist regarding the convertibility of notes, but the central bank has successfully operated on the market when necessary to maintain the exchanges within close limits of parity with gold currencies.

Poland (Centre quoted: *Warsaw*).

1 zloty = 100 grosz.

The depreciation of the Polish mark by a long course of inflation after the War resulted, in 1924, in the introduction of a new currency unit known as the *zloty*, having a mint parity with the sovereign of 25·2215 per £1, as in the case of the currencies of the old Latin Union. As a result of further mismanagement, however, the currency again collapsed and strenuous efforts became necessary to improve the position. By rigid adherence to sound monetary policy and balanced budgets the currency was stabilised for some time at the rate of 43·38 zlotys per pound sterling. Later, in October, 1927, a gold exchange standard was instituted based on a unit devalued to the rate of 1·67177 milligrammes of fine gold per zloty. This gives a mint parity with this country of 43·38 zlotys per sovereign.

The notes of the Bank of Poland are now the only legal tender

paper currency, and are redeemable on demand either in gold or gold exchange. The total note issue must be backed by a reserve in gold or gold exchange of not less than 40 %, but not less than 30 % must be in actual gold.

After 1927 the zloty was kept stable by the operation of a gold exchange standard, but the restrictions since introduced render the standard practically inoperative and the value of the zloty now depends largely on official control.

Portugal (Centre quoted: *Lisbon*).

1 escudo = 100 centavos. 1 conto = 1,000 escudos.

The circulating currency consists mainly of the inconvertible notes of the Bank of Portugal, together with various smaller tokens of silver, nickel and copper.

One result of the great depreciation of the escudo in recent years—in 1924, its value fell to 155·54 escudos per £1—is that the rate of exchange is now quoted in terms of *escudos to the* £1 instead of pence per escudo, as formerly.

In June, 1931, a decree was published establishing the escudo on a new basis (in effect a sterling exchange standard), and fixing its value at 110 escudos per £1 sterling. English sovereigns and half-sovereigns are legal tender in Portugal.

Rumania (Centre quoted: *Bukarest*).

1 leu = 100 bani.

As in the case of the other participants in the Great War, the economic development of Rumania in post-war years was greatly hindered by the depreciation and continual fluctuation of her currency. For some time progress towards reconstruction was prevented by the short-sighted policy of the Rumanian Government, which placed obstacles in the way of the inflow of foreign capital. On a change of Government this policy was reversed, and arrangements were made—with the assistance of the League of Nations—to raise a reconstruction loan of over £20,000,000 distributed in ten of the principal countries. As part of the scheme of reconstruction, the leu was stabilised in February, 1929, on the new gold value of 10 milligrammes, $\frac{9}{10}$ths fine, giving a new mint parity with this country of 813·6 lei per £1.

Bank notes were issued in denominations of 100, 500, 1,000 and 5,000 lei, while subsidiary coins composed of an alloy of nickel and copper were struck for amounts of 1, 2, 5, 10 and 20 lei.

The system adopted was the gold exchange standard, and the

notes of the National Bank of Rumania in amounts of not less than 100,000 lei were made convertible at the Bank's option, into either gold or foreign gold exchange, allowance being made in the latter case for the equivalent of the cost of shipping gold. There are at present extensive restrictions on exchange operations, as a result of which the gold exchange standard is rendered inoperative.

Turkey (Centre quoted: *Constantinople*).

1 piastre = 40 paras.
1 lira or pound (or gold medjidre) = 100 piastres.

Gold coins are $\frac{1}{4}$, $\frac{1}{2}$, 1 lira. Various silver coins were issued, but, although the standard is nominally gold, neither gold nor silver has been coined for some time, and the currency consists chiefly of inconvertible paper. Formerly almost every European nation had its own currency in use, at a certain fixed ratio to the Turkish standard coin. Thus the English sovereign passed at 125 piastres and the French Napoleon at 100, but in consequence of the depreciation of the currency gold is now at a premium and out of circulation, although base silver coins of various currencies are still being used.

In 1928, all the dilapidated paper in use was withdrawn and new notes printed in England were put into circulation.

The currency was stabilised in 1929 at about 110 piastres to the £1 and the Government assumed control of the foreign exchanges.

U.S.S.R. (Centre quoted: *Moscow*).

1 tchervonetz = 10 roubles = 1,000 kopecks.

Prior to the Great War, the currency of Russia was based on the gold rouble of 100 kopecks, the exchange with this country being quoted in terms of roubles per £1. As a result of the War and of the great political and social disorders in the country, the currency has been utterly disorganised and depreciated, various issues having been made by the successive Governments. All such issues are now worthless, and in 1924 the currency was stabilised on a gold basis, the new unit being the *tchervonetz*, equivalent to 10 roubles and theoretically containing 119·4826 grains of pure gold, though no rights of conversion exist. The currency now consists of tchervonetz and rouble notes of various denomination, together with silver and copper coins of lower values.

The silver currency tends, however, to disappear from circulation as soon as it is issued, since the masses show an increasing distrust of the paper money, and are at great pains to hoard any silver coins which come into their possession.

The rate is quoted in Moscow in terms of tchervonetzi per £1,000 or $1,000, but rates on Moscow are now quoted in London in *roubles* per £1 (Par: Rbls. 9·458 per £1).

Russia cannot be said to have a free gold market, as the Soviet Government has a monopoly of foreign trade. The exchange has, however, been kept at parity with gold currencies.

Yugo-Slavia (Centre quoted: *Belgrade*).

1 dinar = 100 paras.

This is another of the post-war States, and its new currency was established in 1921 on the basis of the Latin system, at a gold value of 25·2215 dinars = £1. Subsequently, however, the currency became badly depreciated. In 1930 attempts were made to stabilise the exchanges, and, after a period of *de facto* stabilisation, the currency was devalued, and *de jure* stabilisation (at a rate of 11 dinars = 1 gold dinar) was effected in May, 1931. The new parity with sterling (276·32 dinars = £1) was successfully maintained by a form of gold exchange standard, and, on the abandonment of the gold standard by Britain in 1931, the dinar was pegged to the dollar.

As in most other countries, the gold exchange standard is now ineffective owing to the existence of extensive restrictions on exchange dealings.

AFRICA.

Egypt (Centre quoted: *Alexandria*).

The currency system and units are similar to those of the Sudan, which have already been given. Before the War, English, French, German and Turkish gold coins were current at fixed equivalents, the English sovereign passing at 97½ piastres, as in the case of the Sudan. At present, gold coins (including the sovereign) are still accepted at the old fixed equivalents if they are offered, but only Egyptian currency is legal tender, notes of various denominations being issued by the State and by the National Bank of Egypt, against reserves held in London in the form of Treasury bills and similar cover. English notes are accepted, generally at a small discount on the equivalent of 97½ piastres per £1, and this ratio has been maintained since our suspension of the gold standard.

Morocco (Centre quoted: *Fez*).

French zone: 1 franc = 100 centimes.
Spanish zone: 1 peseta = 100 centimes.
1 rial = 20 biliuns.

Towards the end of 1928, an agreement was concluded between the Banque d'Etat du Maroc (i.e., French Morocco) and the French Treasury, reaffirming the principle of monetary union between the two countries. Under the agreement the Banque d'Etat will buy or sell exchange when necessary with the object of maintaining the Moroccan franc at par with the French franc. The notes of the Banque d'Etat are inconvertible, but silver coins of 10 f. and 20 f. are being issued in the Hinterland, where paper currency is viewed with disfavour.

In Spanish Morocco the legal tender currency consists of Spanish peseta notes and coins, together with silver dollars known as "*hassani*", issued by native Moorish rulers.

AMERICA.

Argentina (Centre quoted: *Buenos Aires*).

44 cents gold = 1 paper peso = 100 centavos.

For many years before the War Argentina suffered from the existence of an inconvertible paper currency, the value of which was frequently depreciated. During the War, the country prospered exceedingly and steps were taken by the Government to improve the currency system. In August, 1927, a gold bullion standard was adopted based on a gold peso having a mint parity of about 47¾ pence. The paper currency was made exchangeable into gold for export at the Conversion Office at this rate, but although a gold coin of 5 pesos, known as the *argentino*, is in existence, gold was not issued for internal circulation. Silver, nickel and copper coins are also issued; the silver peso weighs 27·11 grammes, 900 fine.

While exchange quotations are made in terms of the *gold* peso, the currency in actual use is based on the *paper* peso, the value of which in relation to the gold unit is fixed at 44 %, i.e., $44 gold = $100 paper.

Argentina again suspended the gold standard in 1929, and exchange dealings were subjected to official control. Since November, 1933, two exchange markets have been recognised. The "Official" market is controlled by the Exchange Control Commission, to whom all bills relating to major exports of Argentine produce must be sold, through banks and authorised dealers. The foreign currency accumulated each day is tendered for on the succeeding day, through banks and other authorised dealers, by applicants holding the Exchange Control permit. The other market is the "free" market, confined to exchange which arises from sources other than major exports and which may

be dealt in without the intervention of the Exchange Control Commission.

In January, 1934, the peso was " pegged " to sterling at the rate of 36d. per gold peso, which is the basic rate at which the Exchange Control Commission will purchase export bills. Rates for other currencies are calculated from their value in sterling.

The letters M/L (*moneda legale*) or M/N (*moneda nacionale*) after an amount indicate that it is in *paper pesos*. Gold pesos are indicated by the expression $ oro, and minted gold by the abbreviation o/s (= *oro sellado*).

Bolivia (Centre quoted: *La Paz*).

1 boliviano = 100 centavos.

Acting on the recommendation of Professor Kemmerer, who has taken a very prominent part in the formulation of schemes for the stabilisation of South American currencies, Bolivia towards the end of 1928 thoroughly reorganised her currency and financial position. The Banco de la Nacion Boliviana was reconstituted as the central bank of issue, and the value of the monetary unit, the *boliviano*, was fixed at ·54917 gramme of fine gold, giving a mint parity with sterling of 18d. per boliviano. The gold standard was, however, suspended in 1931, and the central bank has now the monopoly of foreign exchange dealing.

Silver coins, 900 fine, of various denominations, are in circulation, together with nickel coins and the convertible paper notes of the National Bank for 5 bolivianos and upwards.

Brazil (Centre quoted: *Rio de Janeiro*).

1 milreis = 1,000 reis.

Brazil has long suffered from the ill-effects of a depreciated inconvertible currency, and for years her exchange has fluctuated considerably.

An Act of 1927 provided for the stabilisation of the currency on the basis of a new unit, the *cruzeiro* of 100 cents, weighing 800 milligrammes, 900 fine. All existing paper money was to be convertible into the new currency at the rate of 1 cruzeiro = 4 paper milreis, and into gold at the rate of ·200 milligramme of gold, 900 fine, per *paper* milreis.

The new unit was to be introduced after a date of which six months' notice was to be given, and a Stabilisation Board was formed with agents in London and New York, charged with the task of co-operating

with the central bank, the Banco do Brazil, to maintain the exchange at the new parity of 5·899 pence per milreis by the purchase and sale of exchange and the receipt of gold at the fixed rate. But, although a successful stabilisation loan was raised and although the exchange was maintained for some time approximately at the new parity, the new currency unit was never instituted. In 1930, the Stabilisation Board was abolished and its functions transferred to the Banco do Brazil.

As a result of the trade depression and Brazil's difficulty in meeting her foreign obligations, the exchange became badly depreciated, and restrictions had to be placed on exchange dealings. Since November, 1933, the exchange has been " pegged " to sterling at about 4d. per milreis.

The method of quoting large sums in Brazilian currency is peculiar, the amounts being always expressed as so many " contos of reis". A " conto " is 1,000,000 reis or 1,000 milreis (1 milreis = 1,000 reis), and is written 1 : 000 $000. Thus Rs. 69,304 : 350 $500 is equivalent to Rs. 69,304,350,500, or milreis 69,304,350·5.

Chile (Centre quoted: *Valparaiso*).

1 peso = 100 centavos.

The monetary unit is the gold peso, and gold coins of 20, 50 and 100 pesos are coined. The currency long consisted principally of inconvertible paper, but as from January 11, 1926, it was devalued and stabilised on the basis of the 20-peso gold piece of 4·06793 grammes, $\frac{9}{10}$ths fine, giving a Mint Par with London of 40 pesos = £1.

In 1931, Chile instituted strict control of her exchanges, and, following her suspension of the gold standard in 1932, the official exchange value of the peso was fixed at 3d. (gold). There is also a recognised " barter " exchange market through which exchange resulting from certain exports is used in payment for approved imports. On this market, the quotation is known as the " export " rate which, on 13th March, 1934, was 125 pesos per £1 sight.

Ecuador (Centre quoted: *Guayaquil*).

1 sucre = 100 centavos.

After many years of depreciation the currency of Ecuador was reorganised in 1927, when, on the recommendation of the Kemmerer Commission, the monetary unit was devalued and based on the American dollar at the rate of 5 sucres per dollar. The sucre was given a nominal gold content of ·300933 gramme fine, making the mint parity

with sterling 24⅓ sucres per £1. The circulating paper currency was made convertible into gold on demand, and a new Central Reserve Bank was established on lines somewhat similar to those of the American Federal Reserve system.

The gold standard was suspended by Ecuador in 1932, and restrictions were placed on exchange dealings.

Mexico (Centre quoted: *Mexico City*).

1 dollar or peso = 100 centavos.

Mexico was for long on a silver standard, the principal coin being the Mexican dollar. After the War, a gold bullion standard was instituted at a parity of 9·76 Mexican dollars per £1, though silver coins continued to be legal tender for any amount. In July, 1931, the currency was reorganised and the silver peso was established on the gold exchange standard, for which purpose it was given an equivalent of 75 centigrammes of pure gold. There is no exchange control, but though somewhat nominal, the exchange is kept near the old gold parity.

Peru (Centre quoted: *Lima*).

£P1 = 10 soles = 1,000 centavos.

The Peruvian pound was originally equivalent to the pound sterling, and the exchange was quoted from Lima at a premium or discount per cent. for 90 days' sterling sight drafts on London. The circulating currency consisted chiefly of notes issued by the Reserve Bank of Peru against re-discount of commercial bills, subject to the maintenance of a statutory reserve of gold.

Peruvian currency depreciated considerably after the War, but was eventually stabilised on a gold bullion standard at a parity of 12·166 soles per £1. The stabilisation scheme did not, however, prove successful, and eventually a new parity of 17·38 soles per £1 was adopted. The gold standard was suspended in 1932, and the sol is now at a discount in terms of sterling.

San Salvador (Centre quoted: *San Salvador*).

1 colon = 100 centavos.

Prior to 1920, the republic of San Salvador had a paper currency issued under a law of 1900, which provided for a minimum reserve of 50 % in gold and silver. In 1920, the Republic finally adopted the gold standard, basing its new currency on the *colon* or *peso* of 100 centavos, containing ·836 gramme of gold, 900 fine, giving a par of 9·73 colones per £1, and 2 colones per United States dollar.

The currency now consists of gold, silver and nickel coins, together with notes of the three native banks of issue, which must maintain a minimum metallic backing of 40 %, and secure the remainder of their issues with securities approved by the Government. In addition to the national currency, the gold and silver coins of the United States are legal currency and pass for all purposes.

The gold standard was suspended in 1931, and, for a time, restrictions were imposed on exchange dealings, but there is now no control.

United States (Centre quoted: *New York*).

1 dollar = 100 cents.

The monetary unit is the gold dollar. Coins of 1, 2½, 5, 10 and 20 dollars are issued, together with various other coins of nickel and silver, and also many forms of Government and bank paper money.

Before March, 1933, when the United States was forced by financial difficulties to place an embargo on gold exports, the gold dollar was legally equivalent to 25·8 grains of gold, 900 fine, giving a Mint Par with the sovereign of $4·8665 per £1. In February, 1934, the President was given power to vary the gold content of the dollar between 50 and 60 % of its former value, and, up to the time of writing, the gold content has been fixed by proclamation (*but not by law*) at 59·06 % of the old gold content; i.e., the dollar is made equivalent to $15\frac{5}{21}$ grains of gold, 900 fine, giving a Mint Par with the sovereign of $8·24. With this devaluation, the embargo on gold exports was removed and a gold bullion standard was instituted.

ASIA.

China (Centre quoted: *Shanghai*).

1 candareen = 10 cash or li.
1 mace = 10 candareen.
1 tael = 10 mace.
1 Shanghai dollar = ·715 tael.

These are the moneys of account, but the only coin widely used by the masses is the brass *cash* or *li*, the market value of which is fixed by the people themselves, although silver dollars in great variety are in circulation in various parts of the country. The cash is made of an alloy of copper, iron and tin, and although nominally 1,000 cash = 1 tael (a *weight* of silver), the latter is worth anything from 1,000 to 1,800 cash.

As is explained in Chapter XVIII, the currency position of China has long been one of great confusion, and attempts to improve matters are extremely difficult, largely because of the unsatisfactory political state of the country. In March, 1933, it was decreed that the tael should be replaced for exchange purposes by a new standard silver dollar, weighing 26·6971 grammes and containing 88 % or 23·5 grammes of pure silver. The dollar is exchangeable for the Shanghai tael at the rate of ·715 tael per dollar and for the Haikwan tael at 1·558 tael per dollar, but the plan has met with much opposition and the tael is still being widely used for commercial purposes.

French Indo-China (Centre quoted: *Saigon*).

1 piastre = 100 cents.

The currency of French Indo-China was long on a silver basis, but, in 1930, the piastre was made equivalent to 9·09737 grains of fine gold, and is now maintained by means of a gold exchange standard at parity with the franc on the basis of 1 piastre = 10 French francs. The circulating currency consists mainly of notes issued by the Banque de l'Indo Chine.

Japan (Centre quoted: *Kobe*).

1 yen = 100 sen.
1 sen = 10 rin.

From 1871 onwards the legal money was the silver yen of 100 sen, weighing 416 grains troy, 900 fine. This circulated at parity with the Mexican dollar, though the latter had the larger circulation. In 1897 the gold standard was adopted, the gold yen being coined in the proportion of gold to silver of 1 : 16·17, coins of 5, 10 and 20 yen being issued. Notes of various denominations are issued, together with subsidiary coins of silver, nickel and bronze.

Japan was involved in considerable financial difficulty as a result of the Great War and the disastrous earthquake of 1924. The gold standard was eventually restored at the old parity of 2s. 0½d., but was again suspended in December, 1931, and the exchange placed under strict Government control.

Java (Centre quoted: *Batavia*).

1 florin or guilder = 100 cents.

The monetary unit of Java (Netherlands East Indies) is the florin or guilder of 100 cents, of the same value as the Dutch florin, with which the Javanese currency is linked on the gold exchange standard,

operated between Batavia and Amsterdam. Notes of various denomination, together with coins of gold, silver, nickel and bronze, are in circulation.

Palestine. £P1 = 1,000 mils.

Prior to 1929 the principal circulating medium of Palestine consisted of Egyptian currency, introduced mainly by British forces operating in that country during the War. This currency was made legal tender in February, 1921, but it had the disadvantage that neither the British Government—the Mandatory Power—nor the Palestine Government had any control over it.

Accordingly, in November, 1927, a new currency was introduced, based on the *Palestine pound*, having the same gold value as the British pound sterling and being divisible for the convenience of the people into relatively small units—1,000 *mils*. Coins are now issued of varying face value in bronze, nickel-bronze and silver, together with Government notes of 500 mils, £P1, £P10, £P50 and £P100. The currency is maintained on the *sterling exchange standard* by arrangements which provide for its exchange pound for pound into and for British currency in London.

EXCHANGES FROM ONE CURRENCY TO ANOTHER.

The calculations involved in making exchanges from one currency to another are quite simple, but short methods should be used wherever possible, as results are usually sufficiently correct to two or three places. Two methods can generally be used: (*a*) Practice, or (*b*) Decimals. In many cases, the practice method is quicker and likely to give the more accurate result. If decimals are used, the quantities should always be reduced to the simplest terms either by multiplication or by division by a factor (see Chapter XXIII).

Example 1.—Given £1 = Fcs. 125·10, exchange £126 18s. 9d. into francs.

(*a*) By practice:—

100	12510
20	2502
7	875·7
	15887·7
1s. 3d. = $\frac{1}{16}$ of £ =	7·819
	15879·881

(*b*) By decimals:—

126·9375
125·1
12·694
634·687
2538·750
12693·75
15879·881

(*c*) **Short cut:—**

$$125 = \frac{1000}{8}$$

$$\therefore \frac{126937 \cdot 5}{8} = 15867 \cdot 1875$$

$$126 \cdot 9375 \times \cdot 10 = \frac{12 \cdot 69375}{15879 \cdot 88125}$$

Answer to two places: Fcs. 15879·88.

Example 2.—Given Fcs. 124·75 = £1, exchange Fcs. 9876·85 to £ s. d.

$$£\frac{9876 \cdot 85}{124 \cdot 75} = \frac{1975 \cdot 37}{24 \cdot 95}$$

$$\begin{array}{r} 79 \cdot 173 \\ \hline 2495)197537 \\ 22887 \\ 4320 \\ 18250 \\ 785 \end{array}$$

Answer: £79 3s. 6d.

Example 3.—How many rupees would be obtained for £578, exchange at 1s. 6½d. per rupee?

$$\frac{578 \times 240}{18 \cdot 5} = \frac{578 \times 48}{3 \cdot 7} = \frac{27744}{3 \cdot 7}$$

Answer: 7498 rupees 6 annas.

Example 4.—A merchant wishing to cable $5,000 to New York is offered 3·39 plus cable charges by one bank and 3·38¾ all in by another. The cable costs 10s. Which should he accept?

Solution :—

(*a*) $5000 at 3·39 =	£1474	18	6
Cable Charge		10	0
Total cost =	£1475	8	6
(*b*) $5000 at 3·38¾ =	£1476	0	3

The merchant should therefore accept the rate of 3·39.

Example 5.—Find the value of Rs. 79625 @ 1s. 9¼d. per rupee.

Solution:—

If we use decimals, we must multiply 79625 by ·0885416̇, which is a lengthy process and one which might lead to error unless we take the multiplier (·0885416̇) to eight places.

By *practice*, the problem is much simplified:—

			£	s.	d.
79625 @ 1s. 0d.	= $\frac{1}{20}$ of £1, ∴ divide by 20	=	3981	5	0
@ 0s. 6d.	= $\frac{1}{2}$ of 1s.	=	1990	12	6
@ 0s. 3d.	= $\frac{1}{2}$ of 6d.	=	995	6	3
@ 0s. ¼d.	= $\frac{1}{12}$ of 3d.	=	82	18	10
@ 1s. 9¼d.		=	£7050	2	7

Answer (to nearest penny): £7050 2s. 7d.

Alternatively the equivalents could be worked as decimals, and the total converted into £ s. d.:—

79625 @ 1s.	=	£3981·25
@ 6d.	=	1990·625
@ 3d.	=	995·3125
@ ¼d.	=	82·9427083̇
		£7050·1302083̇

Answer: £7050 2s. 7d.

Example 6.—What is the equivalent in yen of £1625 @ 1s. $5\frac{5}{32}$d. per yen?

Solution:—

$$\frac{1625 \times 240}{17\frac{5}{32}} = \frac{1625 \times 240 \times 32}{549}$$

$$= \frac{13000 \times 30 \times 32}{549} = \frac{130000 \times 32}{183}$$

Answer: Yen 22732·24.

It is a golden rule that every answer should be checked back, wherever that is practicable. Thus, we can prove the above answer by *practice*, as follows:—

Yen 22732·24	@ 1s.	=	£1136·612
	@ 3d.	=	284·153
	@ 1½d.	=	142·0765
	@ ½d.	=	47·35883
	@ ⅛d.	=	11·8397
	@ $\frac{1}{32}$d.	=	2·95993
			1624·99996

Exchange Tables.—In business houses where exchange transactions are frequent, tables of multiples are constructed for converting from one currency into another at various rates of exchange. By this means much time and trouble in calculating are saved, and as in normal times rates of exchange fluctuate only within narrow limits, it is not difficult to construct tables covering all the rates required. From these tables the values in another currency of a given amount of money can be written down without calculation.

(1) *Exchange from Sterling.*—Given £1 = 20·52 marks, construct a table for converting any sum from £ s. d. into marks, and write down the value of (1) £196 10s. 7d. and (2) £27 4s. 0d.

Method.—It will be clear after a little thought that if the values in marks, of 1–9 pounds, shillings and pence are obtained to a sufficient number of places in each case, any sum of £ s. d. can easily be converted.

No.	£	s.	d.
1	20·52	1·026	·0855
2	41·04	2·052	·1710
3	61·56	3·078	·2565
4	82·08	4·104	·3420
5	102·60	5·130	·4275
6	123·12	6·156	·5130
7	143·64	7·182	·5985
8	164·16	8·208	·6840
9	184·68	9·234	·7695

The £ column is obtained by multiplying 20·52 by 1, 2, 3, etc., respectively.

The shillings column is for each value $\frac{1}{20}$th of the corresponding value for £1, and the pence column is $\frac{1}{12}$th of the shillings column.

(1) £196 10s. 7d.

	£200	=	Mks. 4104
	Deduct £3	=	61·56
	9s.	=	9·234
	5d.	=	·4275
£196 10s.	7d.	=	Mks. 71·2215 / 4032·7785 Answer.

(2) £27 4s. 0d.

£20 = 410·4
£7 = 143·64
4s. = 4·104
Answer: Mks. 558·144

If the tables are to be used for large amounts, the value of marks in £ must be given to several places of decimals, and the values in each case likewise extended, but the application of the principle is the same. The example just considered is taken from an examination paper, but it will be evident that it cannot be accurately used for amounts of more than two figures, and even then the values of £ can only be obtained to two places, whereas those for pence can be taken to four.

(2) *Exchange into Sterling.*—The construction of tables for conversion of currency into sterling is usually a simple matter, as only one column of values is necessary, giving the equivalents in decimals of £1 of 1–9 units of the foreign currency. The reason for this is that most foreign currencies are expressed in decimals, but as the £ is a large unit, the values should, in practice, extend to several decimal places.

Two cases arise:—

(1) *Pence* rates—when quotations are expressed in English money per foreign unit, e.g., Argentina, 1 peso = 47·5783.
(2) *Currency* rates—when quotations are in foreign money per £1, e.g., Germany, 20·38½ marks = £1.

The method is illustrated by the following table for pesos:

Pesos.	£	Pesos.	£
1	·198243	6	1·189458
2	·396486	7	1·387701
3	·594729	8	1·585944
4	·792972	9	1·784187
5	·991215		

Example: Cost of 8321·45 pesos?

8000 = 1585·944
300 = 59·4729
21 = 4·1631
·45 = ·0892
1649·6692

Answer: £1649 13s. 5d.

A similar table could be constructed for a "pence" rate.

CHAPTER XXVI

THE CHAIN RULE—CALCULATION OF THE MINT PAR AND THE SPECIE POINTS

The Chain Rule.—This is an arithmetical device frequently used in exchange calculations for determining the relationship between two quantities, whose values measured in terms of other fixed related quantities are known or can be found. In the example referred to we were given that $11\frac{3}{4}$ pence = 1 mark, and knowing that 240 pence = £1, we were enabled to determine how many marks were equivalent to a given sum of English money. The principle can be applied to the solution of problems much more involved than this, where a number of related quantities have to be considered before the unknown relationship between two other quantities can be determined.

The method consists in arranging in two columns the quantities whose relationship is known, as in the following example :—

Example 1.

How many francs = £1
if £1 = 20·60 marks,
42 marks = 24 florins
and 100 florins = 1,055 francs ?

This is a simple question arranged with the quantities in two columns, so that the last three equations are statements of known relationships between quantities, and the first equation represents the answer required. It is essential, to arrive at a correct solution by this method, that the first quantity in each equation should be of the same denomination as the last quantity in the preceding equation, and that the last and first quantities should be of the same kind. These quantities of like denomination are said to be "linked"; the answer required is the "missing link" in the chain, and may come first or last, provided the correct sequence is maintained.

The answer is obtained by dividing the product of the numbers on the right by the product of those on the left, as follows:—

$$\frac{20{\cdot}60 \times 24 \times 1055}{42 \times 100}$$

Answer: 124·19 francs.

Innumerable examples can be solved by this method, but great care must be taken to arrange the quantities in correct sequence. In practice, the chain is expressed in as short a way as possible *with the question to be solved as the first equation.* Thus the last example would be written as follows:—

? Fcs. = £1,
£1 = 20·60 mks.,
Mks. 42 = 24 fl.,
Fl. 100 = 1,055 fcs.

Answer: 124·19 francs.

CALCULATION OF THE MINT PARS OF EXCHANGE.

In calculating the Mint Pars of Exchange between the currencies of the principal world centres it is usual to employ the Chain Rule method in order to link up the data obtained from the Mint Regulations of the respective countries. In the examples which follow, the Mint Pars are in most cases calculated correct to the fourth place of decimals. This approximation is sufficiently accurate for most purposes, and is ordinarily used in foreign exchange lists of quotations, but the reader should not overlook the fact that, in certain circumstances, many more places may be required.

Although at the time of writing, the gold standard is suspended in Britain, the gold sovereign remains the basis of our currency system, and the coinage law providing that the sovereign shall contain 123·27447 grains (or 7·98805 grammes) of gold, eleven-twelfths fine, remains unchanged. Hence, any of the following calculations which involve Great Britain are made on this basis, though they are necessarily largely of academic interest so long as we remain off the gold standard.

1. **Switzerland** (and all countries on *Latin Standard*).

First Method.—Simple proportion:—

1 sovereign contains 7·98805 grammes of standard gold.

$\therefore$ 1 „ „ $\frac{7{\cdot}98805 \times 11}{12}$ grammes of pure gold.

1 franc contains $\frac{900}{155 \times 20}$ grammes of pure gold

$$\therefore \text{1 sovereign} = \frac{7 \cdot 98805 \times 11}{12} \div \frac{900}{3100} \text{ francs}$$

$$= \frac{7 \cdot 98805 \times 341}{108}$$

$$\text{Mint Par} = \underline{25 \cdot 2215 \text{ francs per £1.}}$$

By examining the working here given, the reader will observe that the Mint Par between any two gold currencies can be determined with great ease if the weight of *pure* gold in each of the currency units is known *in terms of the same standards of weight.* All that is then necessary is *to divide the greater weight by the less,* and the answer obtained is the Mint Par of Exchange. Thus:—

1 sovereign contains 7·322381 grammes of *pure* gold.
1 Swiss franc contains ·290323 grammes of *pure* gold.

$$\therefore \text{Mint Par} = \frac{7 \cdot 322381}{\cdot 290323} = 25 \cdot 2215 \text{ francs per £1.}$$

Second Method.—By Chain Rule:—

? Francs = £1.
£1 = 7·98805 grammes of standard gold.
Grammes standard 12 = 11 grammes of fine gold.
Grammes fine 900 = 3,100 francs.

$$\text{Mint Par} = \frac{7 \cdot 98805 \times 11 \times 3100}{900 \times 12}$$

Which is exactly the same result as we obtained above by simple proportion.

$$\therefore \text{Mint Par} = \underline{25 \cdot 2215 \text{ francs} = £1.}$$

2. United States.

(*Note.*—In February, 1934, the United States dollar was devalued by Presidential *decree* to 59·06 of its former value. The new gold equivalent of the dollar has not yet been fixed *by law*, however, so in the examples which follow the old gold equivalent is used, viz., 10 gold dollars = 258 grains gold, 900 fine. This does not, of course, make any difference to the *method.*)

By Chain Rule :—

? Dollars = £1.
£1 = 123·27447 grains of standard gold.
Grains standard 12 = 11 grains fine gold.
Grains fine 9 = 10 grains standard, U.S.A.
Grains standard (U.S.A.) 258 = 10 gold dollars.

$$= \frac{123 \cdot 27447 \times 11 \times 10 \times 10}{12 \times 9 \times 258}$$

Mint Par = 4·8666 dollars per £1.

Usually quoted as \$4·86⅔.

3. Germany.

? Marks = £1.
£1 = 7·98805 grammes standard.
Grammes standard 12 = 11 grammes fine.
Grammes fine 1,000 = 2,790 Reichsmarks.

$$= \frac{7 \cdot 98805 \times 11 \times 2790}{12 \times 1000}$$

Mint Par = 20·429 marks per £1.

4. Holland.

? Florins = £1.
£1 = 7·98805 grammes standard gold.
Grammes standard 12 = 11 grammes fine gold.
Grammes fine 6·048 = 10 florins.

$$\frac{10 \times 11 \times 7 \cdot 98805}{12 \times 6 \cdot 048} = \frac{878 \cdot 6855}{72 \cdot 576}$$

Mint Par = 12·107 florins per £1.

5. Scandinavia (Norway, Sweden, and Denmark).

? Kroner = £1.
£1 = 7·98805 grammes of standard gold.
Grammes standard 12 = 11 grammes fine.
Grammes fine 1,000 = 2,480 kroner.

$$\frac{7 \cdot 98805 \times 11 \times 2480}{1000 \times 12}$$

Mint Par = 18·1595 kroner per £1.

6. Belgium.

? Belgas = £1.
£1 = 7·98805 grammes standard.
Grammes standard 12 = 11 grammes fine.
Grammes fine ·209211 = 1 belga.

$$\frac{1 \times 7{\cdot}98805 \times 11 \times 1}{1 \times 12 \times {\cdot}209211} \text{ belgas} = £1$$

Mint Par = 35·00 belgas per £1.

7. Japan.

The Mint Par with Japan, which is quoted in pence per yen, is calculated as follows:—

? Pence = 1 yen,
1 Yen = ·75 gramme fine,
Grammes fine 7·322381 = 240 pence.

Mint Par = 24·5822 pence per yen.

8. France.

? Francs = £1.
£1 = 7·322382 grammes fine.
Grammes fine 900 = 1,000 grammes French standard.
Grammes French standard 6·55 = 100 francs.

$$\frac{7{\cdot}322382 \times 1000 \times 100}{900 \times 6{\cdot}55}$$

Mint Par = 124·2134 fcs. per £1.

9. Italy.

? Lire = £1
£1 = 7·322382 grammes fine.
Grammes fine 7·919 = 100 lire.

$$= \frac{7{\cdot}322382 \times 100}{7{\cdot}919}$$

Mint Par = 92·466 lire per £1.

Foreign Mint Pars.—It will be useful to indicate here how a Mint Par is determined between two foreign States, e.g., France and Holland. Two methods can be used:—

(1) Comparison of Mint Regulations as in the above examples.
(2) Comparison of the two Mint Pars with Great Britain if they are known.

FIRST METHOD:—

(*Note:* The Mint Par between France and Holland is quoted in terms of francs per 100 florins or *vice versa*.)

$$\text{? Francs} = 100 \text{ florins.}$$
$$\text{Fl. } 10 = 6{\cdot}048 \text{ grammes fine.}$$
$$\text{Grammes fine } 900 = 1{,}000 \text{ grammes French standard.}$$
$$\text{French standard grammes } 6{\cdot}55 = 100 \text{ francs.}$$
$$= \frac{100 \times 1000 \times 6{\cdot}048 \times 100}{6{\cdot}55 \times 900 \times 10}$$
$$\text{Mint Par} = \underline{\text{Fcs. } 1{,}025{\cdot}95 \text{ per } 100 \text{ florins.}}$$

SECOND METHOD:—

$$£1 = 124{\cdot}21343 \text{ francs} = 12{\cdot}10710 \text{ florins.}$$

(*Note:* When this method is applied, the two Mint Pars from which the calculation is to be made must be known accurately to at least five places.)

$$\therefore 100 \text{ florins} = \frac{124{\cdot}21343 \times 100}{12{\cdot}10710} \text{ francs}$$
$$\text{Mint Par} = \underline{\text{Fcs. } 1{,}025{\cdot}95 \text{ per } 100 \text{ florins.}}$$

New Mint Parity Between the French Franc and the Dollar.—Following the decree stabilising the dollar at $15\frac{2}{21}$ grains of gold, nine-tenths fine, the American mints were required to buy imported gold at the rate of $35 per fine ounce. The Bank of France's official price for gold is Fcs. 16,963,528 per 1,000 kilos fine, or Fcs. 527·625 per fine ounce (see *post*, page 624). Hence, the Mint Par between the franc and the new dollar, as it would be quoted in New York, is:—

$$\$\frac{35{\cdot}00}{527{\cdot}625} \times 100 \text{ per } 100 \text{ francs}$$
$$\text{i.e., } \$6{\cdot}63\tfrac{1}{2} \text{ per } 100 \text{ francs.}$$

Alternatively, the parity as quoted by Paris would be:—

$$\text{Fcs. } \frac{527{\cdot}625}{35{\cdot}00} = \underline{\text{Fcs. } 15{\cdot}07\tfrac{1}{2} \text{ per } \$1.}$$

CALCULATION OF THE SPECIE POINTS.

In view of the considerations and changes which have been discussed in Chapter IV, it will be clear that no gold shipments are

now undertaken from one country to another until careful investigation of the whole position has been made, and the anticipated "outturn" calculated after making allowance for all the expenses, charges and allowances which have to be made at both ends. How necessary this is can be seen from the following summary of the charges made in London and certain other centres at the time of writing on the import and export of gold. A perusal of this summary should enable the reader more easily to understand the specie point calculations which follow at the end of this chapter, but it must be reiterated that the items of cost are in no sense fixed, and it will be seen that, whereas some charges, e.g., the handling charge in London, vary in *direct* proportion to the quantity of gold involved, other charges become relatively lighter as the quantity increases, whilst others again vary according to the fineness of the bullion.

GOLD CHARGES IN THE LEADING CENTRES.

LONDON.

Gold is usually bought and sold in London through the recognised bullion brokers, who charge a commission of ¼ ‰ payable by the seller of the bullion. In addition, the bullion brokers also handle shipments on behalf of clients, for which they make a handling charge of ¼ ‰, or in some cases ½d. per ounce.

When gold is imported or exported, various other charges are incurred. Thus, in the case of imports, it may be necessary to have the gold refined and assayed, if a recognised Assayer's certificate is not available. Also in the case of exports, it is obvious that allowance must be made for the cost of boxes and packing.

Apart from freight and insurance, the expenses which may be incurred in the case of imports are the following:—

MISCELLANEOUS CHARGES.

Port Rates (London)	1½d. %
Customs entry and clearance ..	5/– nominal
Cartage (including escort)	£3/10/– per £100,000

MELTING AND REFINING CHARGES (since 1st December, 1931).

Gold coin (sovereigns)	¼d. per oz.
Bar Gold 995/1,000..	½d. ,, ,,
990/994·9	¾d. ,, ,,
940/989·9	1d. ,, ,,
900/939·9	1¼d. ,, ,,
800/899·9	2d. ,, ,,
700/799·9	2¼d. ,, ,,
Under 700	2½d. ,, ,,

ALLOWANCE FOR SILVER.

Bars from the Far East frequently contain a small proportion of silver for which the refiners make an allowance at the market rate.

ASSAY CHARGES.

900 fine and over	3/– per bar (say $\frac{1}{10}$ per mille).
Under 900 fine	4/– ,, ,,

Bars bearing a mint stamp (e.g., Bombay) and Assay Report stamped on them do not require a London assay, as the refiner accepts the mint report.

When bullion is melted the cost of the assay is paid for by the seller. The refiner provides a buyer with the assay free of charge.

Gold obtained from London for delivery to foreign central banks is in bars of about 400 ounces troy of quality *not* below ·995 fine, and has to be accompanied by an assay of a recognised English assayer. An exception was made during 1930–31 when, owing to the weakness of sterling, it was necessary to melt large quantities of sovereigns into standard bars for export.

In the case of exports, the following expenses are incurred in addition to cartage, and the customs clearance fee:—

BOXES AND PACKING: 4/– per box (one box contains 4 bars).

INSURANCE RATES.

New York, 1/– %; Paris, Amsterdam, Brussels, 6d. %.

FREIGHT.

London and New York, 5/6d. %.

London and Paris.

	996 *fine.*	916 *fine.*
By Air.		
Under £5,000	2/6d. %	2/6d. %
£5,000 min.	2/– %	2/– %
£25,000 min.	1/6d. %	1/9d. %
£50,000 min.	1/3d. %	1/4d. %
By Rail and Steamer.		
£25,000 min.	2/6d. %	2/9d. %
£50,000 min.	1/9d. %	2/– %
£300,000 min.	1/1d. %	1/2d. %

(*Note.*—The freight is based on the value of the gold, so is higher for quantities of gold of the lower fineness, because the bulk of such gold is greater than the bulk of finer gold.)

London and Amsterdam.

By Air.	
Under 100 kilos	2/2d. per kilo gross
Over 100 kilos	1/9d. ,, ,, ,,
By Rail and Sea.	
Under 100 kilos	2/– per kilo gross
Over 100 kilos	1/9d. ,, ,, ,,

London and Brussels.

By Air.

Under 100 kilos	..	..	..	2/– per kilo
Over 100 kilos	..	..	..	1/9d. ,, ,,

By Rail and Sea.

Over 100 kilos	..	..	..	1/2d. per kilo

NEW YORK.

In President Roosevelt's provisional stabilisation plan of February, 1934, the American mints were authorised to *purchase* imported gold in the form of bars of ·889 or finer at the fixed price of $35·00 per fine ounce, less ¼ % Treasury charge and the usual melting and refining charges. The *selling* price was fixed at $35 per fine ounce, plus ¼ % Treasury charge and the usual other charges. These charges in New York at the time of writing are shown below, together with other items which enter into the cost of moving gold to and from the United States:—

INCIDENTAL CHARGES IN NEW YORK.

Brokerage	..	..	..	..	¼ ‰
Truckage	..	..	..	..	4 c. per $1,000
Customs declaration, cord and seal				..	$10·05 nominal

MELTING: $1 per 1,000 oz. plus 10 c. for each 100 oz. or fraction thereof, computed on weight after melting.
Not charged on non-current U.S. coin and stamped Mint Bars.

Allowance for Loss in weight on Melting.—As melting and refining is done much less carefully in New York than it is in London, an exporter of the metal to the former centre must make an allowance for any loss which may thus be incurred, and it is customary in London to allow ¼ ‰ for this purpose.

REFINING CHARGES.

Where deposits of gold bullion contain eight thousandths ($\frac{8}{1000}$) or more of silver base, or where the alloy is not suitable for coinage, additional refining charges are imposed by the United States Assay Office, and these charges range from 1 to 8½ cents per gross ounce. It is therefore very necessary to see that gold shipped to New York has a copper base content. This is customary in the case of bars refined in Europe but if the gold is bought in the Far East allowance must be made for any additional refining charges which may be incurred in New York because of the presence of too much silver or of an unacceptable alloy in the gold.

INTEREST.

In reckoning interest on gold shipments to the United States, allowance must be made for the fact that, in respect of gold handed to it, the United States Treasury pays for only 97–98 % on the day after arrival, and that the balance is not paid for until the expiration of from three to four weeks.

FRANCE.

The Bank of France is required to redeem its notes on demand *either* in French gold coins *or* in gold bullion at its option. By agreement between the Minister of Finance and the Bank, a minimum can be fixed for the amounts to be redeemed. For the present, the minimum has been fixed at 215,000 francs, which corresponds approximately to the most usual weight of gold bars.

Gold is bought and sold by the Bank of France at a fixed price, but the *buying* price is subject to a reduction for minting and assaying costs. At the time of writing, the maximum charge for minting is Fcs. 40 per kilo, but this may be reduced if it is desired to encourage gold imports. There is no legal minimum as to the amount of gold which the Bank of France may accept and there are no restrictions on the import or export of gold, but various physical hindrances may be put in the way of unduly rapid withdrawals of gold.

The Bank's fixed *selling price* is	Fcs. 16,963,528 per 1,000 kilos fine
As 1,000 kilos = 32,150·727 oz. troy, this price is equivalent to	Fcs. 527·625 per fine ounce.
The Bank's *buying price* is	Fcs. 16,963,528 per 1,000 kilos fine
Less Fcs. 40 per kilo standard (i.e., French Standard, ·900 fine) ..	44,444
Net	Fcs. 16,919,084 per 1,000 kilos fine
= Fcs. 526·24266 per fine ounce.	

In France, gold is accepted for minting only from the Bank of France.

On 14th January, 1931, the Bank of France, which had previously insisted upon receiving gold in "fine" bars (i.e., between 995 and 1,000 fine), agreed to accept gold of British standard fineness, viz., $916\frac{2}{3}$ fine. The Bank will, generally speaking, buy gold of any degree of fineness between 1,000 and 900, the latter being the legal degree of French gold currency, and will, as a matter of customary tolerance, admit a thousandth less.

HOLLAND.

The Netherlands Bank is *not* required by statute to purchase gold offered to it, but, as long as it is able, the Bank will put gold at the disposal of exporters for export to countries which themselves authorise the free export of gold. The export and import of gold are otherwise unrestricted.

The Bank is under no legal obligation to redeem its notes in gold,

and may, at its option, redeem them in other media of payment which are unlimited legal tender, e.g., silver coins.

The Bank's *buying price* is	Fls. 1,647·500	per kilo fine
Less assay charge (Fl. 3·50 per bar), say ..	Fl. ·280	
Net .. .. =	Fls. 1,647·220	per kilo fine

Equivalent to Fls. 51·2343 per fine ounce.

The Bank's *selling price* is	Fls. 1,653·44	per kilo fine

Equivalent to Fls. 51·4278 per fine ounce.

The Dutch Mint is required to coin for private persons unless it is unable to do so on account of pressure of work for the State.

BELGIUM.

The National Bank of Belgium is not required by law to purchase gold offered to it, but by its Internal Regulations, it will buy gold at 4,763·1338 belgas per kilo fine, or 148·150111 belgas per fine ounce.

Bars must weigh about 12½ kilogrammes, and must not be of a lower fineness than 900. Gold bars must be accompanied by the Assay Certificate of a recognised Belgian assayer, though the Bank may accept bars covered by the Certificate of a recognised *foreign* assayer, subject to its right to have part or all of them assayed at its own refineries, whose charge, debited to the seller, is 45 francs per bar. Foreign coins in good condition are accepted at Mint Par rates.

The Bank is required, on demand, to redeem its notes, at its option in (*a*) gold, *or* (*b*) silver at the value in gold (though silver is no longer held in bank reserves); *or* (*c*) foreign gold exchange.

The Bank will sell gold at the legal rate of ·209211 gramme fine per belga, i.e., 4,779·8634 belgas per kilogramme fine, or 148·67046 belgas per fine ounce.

In Belgium, the export and import of gold are unrestricted, while the *minting of gold* is free for private persons as well as for the National Bank, but, as no change has been made in the Mint Regulations to give effect to the post-war devaluation, this freedom is entirely theoretical.

SWITZERLAND.

The export and import of gold are unrestricted in Switzerland, but the Swiss National Bank is not required to purchase gold offered to it. The Bank is required to redeem its notes on demand in Swiss

gold coin, but as long as other banks considered important by the authorities do not redeem *their* notes in gold coin, the Bank has the option to redeem its notes in (*a*) Swiss gold coin; *or* (*b*) gold bullion; *or* (*c*) gold exchange on countries possessing a free gold market.

The Federal Mint is required to mint gold for private persons into 20-franc and 10-franc pieces in quantities of not less than 100,000 francs, subject to the sanction of the Department of Finance in every instance. One kilogramme of gold, $\frac{9}{10}$ths fine, is coined into 3,100 francs, i.e., one kilogramme of *fine* gold is coined into $3,444\frac{4}{9}$ francs. The 10-franc gold piece contains 3·22508 grammes of gold, $\frac{9}{10}$ths fine, and 1 oz. fine gold is contained in 107·1342 Swiss francs.

Determining the Outturn of a Shipment from London.—We are now in a position to consider the practical calculations made by a bullion arbitrageur *before* he decides to undertake a gold shipment, and also the calculations which he makes in order to ascertain his net profit or "outturn" on a given operation.

In determining the actual outturn of a shipment which has been effected, the bullion dealer will, of course, have before him complete details of (*a*) the price at which the gold was bought in the exporting centre; (*b*) all the expenses involved; (*c*) the rate of interest which must be taken into account; (*d*) the total time (in days) for which interest must be calculated, i.e., the period from the date of purchase in the exporting centre to the date on which credit is received from the sale of the gold; (*e*) the price at which the gold is sold in the importing centre; (*f*) the rate of exchange at which the proceeds of the gold were sold on the Foreign Exchange Market.

The calculation of the allowance for interest calls for particular care. If the arbitrageur recoups himself by selling T.T. on the centre to which the gold is exported, he will incur an overdraft *in that centre* until the arrival of the gold. On the other hand, he may cover by selling a sight draft (in which case there will be little, if any, loss of interest); or by selling the proceeds *forward*, if it is possible to arrange such a transaction. Finally, he may decide to incur an overdraft (or to use his own funds) *in his own centre* and to defer selling T.T. until the gold reaches its destination.

The following is a statement in respect of a shipment of gold from London to New York in March, 1934, the gold having been purchased in London at 136/10½d. per fine ounce, and sold in New York at the United States Treasury's buying price of $35 per fine ounce.

LONDON AND NEW YORK.

PRO FORMA.

Invoice for 230 Bars Gold.

Shipped to New York per s.s. *Olympic.*
87,439·550 oz. @ ·998 fine.

	£	s.	d.
= Oz. Fine 87,264·534 @ 136/10½d. per oz.	597,216	13	1
SHIPPING CHARGES LONDON TO NEW YORK:			
Freight @ 5/6d. % on £597,250 = ...	1,642	8	9
Insurance @ 1/– % on £600,000 (c.i.f. value) = ...	300	0	0
Boxes and Packing (4/– per box) = ...	11	12	0
Bills of Lading and Customs clearance = ...	0	5	0
London Handling charge ¼ °/₀₀	149	5	0
	£599,320	3	10
Interest (on C. and F. value):			
*10 days @ 2½ % on £599,000 .. .. £410 5 6			
*30 days @ 2½ % on £18,000 (3 %) .. 36 19 9			
	447	5	3
	£599,767	9	1

NOTE.—Credit was given by the United States Treasury for only 97 % of the gold on arrival, i.e., in 10 days after leaving London. Credit for the balance of 3 % was given in 30 days.

OUTTURN IN NEW YORK.

87,427·83 oz.* @ ·998 fineness =		
87,252·97 oz. fine sold to U.S. Treasury @ $35 per oz. fine ..		$3,053,853·95
Less ¼ % Treasury charge		7,634·65
		3,046,219·30
Less Melting charge ($1 per 1,000 oz. on 87,427·83 oz.) ..		87·43
Net Proceeds from Assay Office		3,046,131·87
Less :—		
Brokerage in New York on net outturn ¼ °/₀₀	$761·50	
Trucking charges (4 c. per $1,000) ..	122·15	
Customs declaration, cord and seal	10·05	
		893·70
		$3,045,238·17

*Note loss of weight, viz.:—

Weight before melting	87,439·55
Weight after melting	87,427·83
	11·72 oz. = ·0134 %

Result of Transaction.

	£	s.	d.
Sold $3,045,238·17 @ 5·07¼ = ...	600,342	13	4
Bought 87,264·534 oz. Gold at total cost of	599,767	9	1
Profit is therefore	£575	4	3

Equivalent to a further return of about 3 % on original outlay of £599,320, making with the 2½ % interest allowed for in the Invoice, a:—

Total return of 5½ % p.a.

Rate of Exchange produced by export of Gold from London to New York on the date in question:—

$$= \frac{\$3,045,238}{£599,767} = \underline{\$5 \cdot 0773 \text{ per } £1.}$$

The London "handling charge" taken into account in this statement is the charge made by the bullion brokers who purchase the gold and arrange for its shipment, while the item "brokerage in New York" is the corresponding charge on the other side for collecting the gold and arranging for its disposal. If the gold is being moved at one or both ends by bullion dealers who do *not* have to pay away such commission or brokerage, then, of course, the position is that they can make a slight extra profit on shipments of the metal as compared with banks or other concerns who have to employ the services of bullion brokers. Moreover, it means that firms which can avoid or lessen this or any other item of expense may profitably move gold at a less favourable rate of exchange than their competitors in this business.

Strictly speaking, the export gold point from one country A to another country B at any particular time is the highest rate of exchange, i.e., the most favourable rate to A, at which gold will move, since bankers and others who are in a position to ignore certain expenses will naturally ship gold as soon as they see a prospect of profit in the operation.

Rough Estimate.—Dealers who undertake shipments of the kind here illustrated must, of course, have before them full details of all the costs and charges which have to be incurred in moving gold between the leading world centres, and they have arrangements whereby they are immediately advised of any changes in gold prices, rates or expenses so that they can quickly determine whether or not shipments would be profitable. To this end an estimate of the probable outturn will be made on a percentage basis, which, in the case of the shipment covered by the above account, would appear as follows:—

London market price of fine gold, 136/10½d., i.e., £6·84375.

LONDON CHARGES:	
Freight (5/6d. %)	·275 %
Insurance (1/–)	·050 %
Handling (¼ °/₀₀)	·025 %
Boxes (4/– per 1,600 oz.) say	·002 %
Interest (@ 2½ % p.a.):	
10 days on whole amount	·068 %
30 days on 3 % of amount	·006 %
	·426 %

NEW YORK CHARGES:

Brokerage (¼ °/₀₀)	·025 %
Trucking charges (·04 °/₀₀)	·004 %
Melting (fine bars), $1 per 1,000 oz.	·003 %
Allowance for loss in weight (¼ °/₀₀)	·025 %
	·057 %
U.S. Treasury charge (¼ %)	·25 %
	·307 %

NEW YORK PRICE			$35·00
Less Charges, New York	·307 %		
London	·426 %		
		·733 %, say,	·255
Net outturn			$34·745

$$\textit{Required exchange} = \frac{\text{Net outturn}}{\text{London price}} = \frac{34·745}{6·84375} = 5·07689.$$

Thus, by buying gold in London and selling it in New York, a dealer can obtain the equivalent of $5·07689 per £1 to his credit in the latter centre, and he can, therefore, make a profit if he can *sell* dollars on the London Market at any rate lower than this, e.g., at 5·07½. At this exchange a shipment to New York would give a small profit, which would be increased if the actual loss in weight in New York was smaller than the dealer's allowance (¼‰), as was actually the case in the foregoing example, where the loss was only ·0134%.

In other words, when the price of gold in London is 136s. 10½d., and expenses are those given in the statement, the *export specie point* between London and New York is $5·07689 per £1, but this figure would naturally vary with any change in the items of expense or other factors in the calculation.

London and Paris.—The following are statements relative to shipments of gold from London to Paris and from Paris to London. It will be seen that the shipment in the first case yields a rate of exchange of 79·61, so that if the francs can be sold in London at any rate lower than this, a profit would be made by the operator. In the other case, the statement is compiled to indicate the lowest price at which gold from Paris can be sold in London to yield a profit with the exchange standing at 77·30 francs per £1.

LONDON TO PARIS.

Pro Forma. Invoice for 250 Bars Gold.

	£	s.	d.
100,000 fine (= 3,110·3495 kilos) @ 132/–	660,000	0	0
Freight @ 1/1d. %	357	10	0
Insurance (on £675,000) @ 6d. %	168	15	0
London Handling @ ¼ ‰	165	0	0
Paris Commission @ ¼ ‰	165	0	0
Paris Incidentals @ $\frac{1}{20}$ ‰	33	0	0
Packing (4/– per box)	12	12	0
Bills of Lading and Customs Clearance		10	0
Interest for two days at 3 % p.a. (on £660,500)	108	11	6
	£661,010	18	6

PARIS OUTTURN.

3,110·3495 kilos @ Fcs. 16,919·084 per kilo .. .. = Fcs. 52,624,264·46

$$\textit{Equivalent exchange} = \frac{52,624,264\cdot46}{661,010\cdot925} = \text{Fcs. } 79\cdot61 \text{ per £1.}$$

NOTE.—This calculation is based on the assumption that commission is paid in both centres and that (as is usual) Assay Certificates are provided by recognised London Assayers so that no assay charges are incurred in Paris.

PARIS TO LONDON.

Pro Forma. Invoice for 230 Bars Gold.

Gross weight = Oz. 87,439·550.

Oz. fine = 87,264·534 = Kilos fine 2,714·232

@ Francs 16,963·528 per kilo = French Fcs. 46,042,952

Plus :—

Paris Commission ¼ ‰				11,511
Freight—Paris to London @ ·7 ‰				32,230
Packing and sundries				1,500
Insurance, Fcs. 48,000,000 @ ¼ ‰				12,000
Total cost .. .. =				Fcs. 46,100,193
Fcs. 46,100,193 bought @ 77·30	£596,380	5	0	
Interest for two days @ 3 % p.a.	98	0	8	
London Handling charge, ¼ ‰ (on sterling value of gold, £597,132*)	149	5	2	
Sterling outlay	£596,627	10	10	

Equivalent London price at which gold must be sold to cover cost

$$\text{and expenses} = £\frac{596,627\cdot54}{87,264\cdot534} = 136/9\text{d. per fine ounce.}$$

Actual price realised = 136/10¼d.

say, £597,132 0s. 0d.*

$$\text{Export point, Paris to London} = \frac{46,100,193}{597,132} = \text{Fcs. } 77\cdot202 \text{ per £1.}$$

*NOTE.—The above calculation is based upon ¼ ‰ commission in both Paris and London. This figure will be less where the transaction is handled by a financial house with a branch in Paris, but, during the rush to withdraw gold from Paris in February, 1934, the combined London–Paris commission was increased for a time to 2 ‰.

Rough Estimate for Paris.—As in the case of New York, the bullion dealer will keep before him details in reference to the French exchange which will enable him to compute at a moment's notice the conditions in which he can make a profit by shipping gold either to Paris or to London. The following is an approximate statement of the manner in which a bullion dealer will reckon the gold export point from London to Paris:—

		Based on London Price of Gold at per oz. fine:—		
Shipment to Paris:—		130/–	140/–	150/–
100,000 oz. fine		£650,000·00	£700,000·00	£750,000·00
Plus—				
Freight				
Insurance ..				
Brokerage ..				
Packing	say 2/9d. %	893·75	962·50	1,031·25
Customs ..				
Cables				
Incidentals ..				
2 days' interest at 2½ % p.a. = ·0137 %		89·05	95·90	102·75
	(A)	£650,982·80	£701,058·40	£751,134·00

(Difference for each 1/– in price of gold = £5,007·815.)

	Fcs.
1,000 kilos fine at Fcs. 16,963·528 per kilo	16,963,528
Less Bank of France Minting Costs	44,444
Net French Buying Price	16,919,084
100,000 oz.	= 52,624,266 (B)

(1,000 kilos = 32,150·727 oz. fine.)

Gold Export Point = $\frac{B}{A}$ = Fcs.	@ 130/–	@ 140/–	@ 150/–
	80·838	75·064	70·060

Conditions Before 1931.—The foregoing statements may be usefully compared with the following statements of gold movements between New York and London, and Paris and London, during 1929. At that time gold could be purchased and sold in London at the Bank of

England's price or at rates closely proximating thereto, while gold was being purchased and sold by the United States Treasury at the fixed price of $20·67183 per fine ounce.

Gold Export Point, London to New York, 1929.

	£	s.	d.
100,000 fine ounces bought from the Market at 84/11·4546d.	424,772	15	0
Freight, 3s. on £424,800	637	4	0
Insurance, 9d. % on £429,020*	160	17	6
Interest, 8 days @ 5 %	465	10	6
Boxes and Packing	16	10	0
Brokerage in London, 5s. °/₀₀	106	5	0
Commission in New York, 5s. °/₀₀	106	5	0
	£426,265	7	0

* Gold value plus 1 %.

100,000 fine ounces sold to the United States Treasury at $20·67183 = $2,067,183.

$$\text{Export point, London to New York} = \frac{2067183}{426265}$$

= $4·8495 per £1.

or $4·84$\frac{15}{16}$ per £1.

Gold Export Point, London to Paris, 1929.

	£	s.	d.
32,150·725 oz. fine gold bought in London from the Bank of England at 84/11½d.	136,573	12	0
Carriage at 10½d. per £100	59	15	3
Insurance at 6d. per £100	34	3	0
Packing 20 boxes at 5/–	5	0	0
Interest, two days at 4½ °/₀	33	13	6
	£136,706	3	9

1,000 kilos of fine gold sold to the Bank of France at 16,963·50 per kilo	Fcs. 16,963,500
Minting costs at Fcs. 20 per kilo, 900 fine, say	22,184
Net proceeds	Fcs. 16,941,316

$$\text{Export specie point, London to Paris} = \text{Fcs. } \frac{16,941,316}{136,706·1875}$$

= Fcs. 123·92½ per £1.

It will be observed that the French minting cost taken into account in this calculation is only Fcs. 20 per kilo, as against the charge of Fcs. 40 per kilo which is operative at the time of writing and which is used in the more recent calculations included above.

PROBLEMS INVOLVING SPECIE POINT CALCULATIONS.

Example 1.—A London dealer purchases 100,000 ounces of fine gold in the London Bullion Market for shipment to New York, at the rate of 84/11$\frac{3}{8}$d. per fine ounce. The following charges are incurred in connection with the shipment:

Freight, 3/– %; insurance, 1/– %; packing and incidental charges, 1/– %. On arrival in New York seven days after shipment, the gold is sold to the U.S. Treasury at the rate of $20·67183 per fine ounce. Against the proceeds of the sale of the gold in New York, the dealer sells a sight draft on that centre at a rate of $4·84$\frac{15}{16}$ per £1. Assuming that the sight draft will not be presented for payment until the date when the proceeds are available, find the dealer's profit or loss on the transaction.

Solution :—

		£
Cost of 100,000 ounces of fine gold at 84/11$\frac{3}{8}$d. per ounce	= £424,739·5833	
Add Freight, Insurance and Packing @ 5/– %	= 1,061·84895	
Total Cost	= 425,801·4323	
Proceeds of 100,000 ounces at $20·67183 per fine ounce	= $2,067,183	
The dealer will sell a sight draft for $2,067,183 at $4·84$\frac{15}{16}$		
Realising £$\frac{2,067,183}{4·849375}$	= 426,278·232	
∴ Dealer's Profit	= £476·8	
= £476 16s. 0d.		

Example 2.—Given the following data, calculate the gold export point to New York:—

Bar Gold is obtainable in London at 84/11d. per fine ounce. Freight charges are $\frac{3}{20}$ %; Interest 10 days at 4$\frac{1}{2}$ % p.a.; Insurance 1/– % on gold value. The gold can be sold in New York at $20·67183 per fine ounce. (Packing and trucking in London $\frac{1}{8}$ ‰.)

Solution :—

Cost of 1 fine oz. of gold in London = £4 4s. 11d.		= £4·24583
Add Charges:—	%	
Freight $\frac{3}{20}$ %	= ·15	
Interest 10 days at 4$\frac{1}{2}$ % p.a.	= ·125	
Insurance at $\frac{1}{2}$ ‰	= ·05	
Packing and Trucking $\frac{1}{8}$ ‰	= ·0125	
	·3375	
·3375 % of £4·24583	= ·01437	
Cost per fine oz. c.i.f. New York		£4·26020
One fine oz. is saleable in New York for	$20·67183	
∴ Gold point, London to New York	= $\frac{20·67183}{4·26020}$	
= $4·85232 or $4·85$\frac{13}{16}$ (approx.).		

Example 3.—An exchange operator in New York instructs his agents in London to purchase 100,000 ounces of fine gold at the current market price of 96/7$\frac{1}{2}$d. per fine ounce. At the same time he purchases T.T. on London to cover the cost of the gold and the expenses of shipment at the current rate of exchange of $4·10 per £1. The following charges are incurred in connection with the shipment: Agent's commission, $\frac{1}{16}$ %; freight, 3/– %; insurance, 1/– %; packing and incidental charges, 1/– %. On arrival in New York seven days after the purchase, the gold is sold to the U.S. Treasury at the standard price of

$20·67183 per fine ounce. The rate of interest obtainable on banker's funds in New York is 4 %, and is calculated on a 360-day year.

Calculate the profit or loss on the transaction.

Solution :—

Cost of 100,000 ounces of fine gold at 96/7½d. per ounce	=	£483,125
Add Freight and other charges @ 5/– %		1,207·812
Agent's commission		301·953
		£484,634·765
£484,634·765 at $4·10 per £1	=	$1,987,002·537
Plus interest for seven days @ 4 % p.a.	=	1,545·446
∴ Net cost of shipment to American dealer	=	$1,988,547·983
Proceeds of gold in New York = 100,000 oz. @ $20·67183	=	2,067,183·000
∴ Dealer's profit	=	$78,635·017

Say, $78,635.

Example 4.—(*a*) If the Bank of France pays Fcs. 16,901·306 per kilogramme of fine gold (31·1035 grammes = 1 ounce), and the franc–sterling rate of exchange is 83⅛ francs per £1, what is the equivalent price of fine gold per ounce in London, neglecting all expenses?

(*b*) Using the answer to the foregoing, if the buying price for gold in the United States is fixed at $33·65 per fine ounce, what is the equivalent rate of exchange between the dollar and the pound?

Solution :—

(*a*)

? How many £ = 1 ounce fine gold
If 1 ounce = 31·1035 grs.
1,000 grs. = Fcs. 16,901·306
Fcs. 83·125 = £1?

$$\frac{31·1035 \times 16,901·306}{83,125}$$

= 6·3241

French parity price = £6 6s. 5¾d. per fine ounce.

(*b*) Equivalent rate of exchange between London and New York is

$$\$\frac{33·65}{6·324} \text{ per £1.}$$

= $5·321

= $5·32$\frac{3}{32}$ per £1.

CHAPTER XXVII

REMITTANCES AND DRAFTS—LONG AND SHORT RATES—"TEL QUEL" RATES

THE actual method by which settlement of a debt for goods is to be effected will in most cases be arranged by the parties at the time the bargain is made. Sometimes it may be tacitly understood that the method to be followed is one which is well known and firmly established in the particular trade concerned, but it is, of course, far better to avoid any possibility of mistake or misunderstanding by having the matter clearly settled in the correspondence or on the order form and acceptance letter.

Settlement by Telegraphic Transfer or Cable. — Probably the simplest method of settling a debt payable abroad is that whereby the debtor requests his banker to instruct the latter's agents in a foreign centre by T.T. or by cable to pay a specified sum to a named person or concern. In such a case, the remitter is usually quoted an "all in" rate by the banker for the facility, or he is quoted a rate exclusive of the cost of the telegram, which may be charged separately. The rate will, in any case, include the bank's profit, but, as we have seen in an earlier chapter, finer rates are quoted according to the amount involved and the importance of the customer.

The calculation of the sterling equivalent of a T.T. or cable merely involves a translation from one currency to the other at the rate to be applied. No interest has to be taken into account, since the foreign currency equivalent is paid out on the other side on the same day as sterling is paid here. (See *valeur compensée*, page 89.)

Nearest Commercial Rate.—A banker who is asked by a customer to buy or to sell a draft or T.T. will base the rate he quotes on the rates at which he can *cover* his operation in the market. He will add (or deduct as the case may be) any necessary allowances to the relevant market rate, and will quote the *nearest commercial rate in his own favour*. That is to say, if he is *buying* a bill in dollars and works out the rate to $4·82755, he will apply the next highest commercial rate,

i.e., $\$4 \cdot 82\frac{49}{64}$, and not the next lowest, i.e., $\$4 \cdot 82\frac{3}{4}$, although the latter is nearer to his calculated decimal. If he were *selling*, he would, of course, apply the lower rate, viz., $\$4 \cdot 82\frac{3}{4}$.

Example 1.—For what amount in sterling would your bank dealer sell a customer a T.T. on New York for $100,000, if the Market quotes $\$4 \cdot 86\frac{11}{16}$–$4 \cdot 86\frac{13}{16}$, and the dealer reckons his profit at $\frac{1}{16}$ in the rate?

Solution :—

Dealer can cover a sale of T.T. by buying in the Market at $\$4 \cdot 86\frac{11}{16}$. He will therefore base his rate for quoting to the customer on that rate:—

Dealer's selling price for T.T. is $\$4 \cdot 86\frac{11}{16}$ *less* $\frac{1}{16}$ (" sell low "),
i.e., $4 \cdot 86\frac{5}{8}$ per £1.

$$\therefore \text{ Amount charged to customer} = £\frac{100{,}000}{4 \cdot 86625}$$
$$= \underline{£20{,}549\ 14s.\ 1d.}$$

Example 2.—Calculate the price a dealer would charge a customer for a T.T. on Buenos Ayres for 25,000 pesos, if the dealer is quoted $47\frac{55}{64}$–$47\frac{57}{64}$ by the Market, and requires a margin for profit of 1 per mille?

Solution:—

If the dealer sells to his customer he must cover by *buying* in the Market, in this case at $47\frac{57}{64}$ pence. He must therefore charge his customer more than this price, i.e., *add* his profit:—

Dealer's selling price for T.T. is	47·890625	pence.
Plus his profit @ 1 per mille	·047891	
i.e., ...	47·938516	,,

He will quote the next highest sixty-fourth:—

$$\begin{array}{r} \cdot 938516 \\ \times\ 64 \\ \hline 3 \cdot 754064 \\ 56 \cdot 31096 \\ \hline 60 \cdot 065024 \end{array}$$

—i.e., 61 sixty-fourths.

Say, $\underline{47\frac{61}{64}}$ pence per peso.

$$\therefore \text{ Amount charged to customer} = £25{,}000 \times 47\tfrac{61}{64} \times \tfrac{1}{240} \times \tfrac{44}{100}$$
$$= \underline{£2{,}197\ 17s.\ 0d.}$$

Important Note.—Although the London Market quotation on Buenos Aires is in pence per *gold* peso, all transfers are in *paper* pesos, whose value is only 44% of that of the gold currency (see page 604).

Settlement by Mail Transfer.—Since payment by telegraphic transfer is the most expensive method of effecting the settlement of a debt, and involves not only a less favourable rate to the remitter, but also expenses for the telegram or cable, parties to a commercial transaction, who wish to settle in less time than would be taken by a long bill, may arrange that payment shall be made through a banker by *mail transfer*.

The rates for mail transfers are *cheaper* than the rates for T.T. and cable, because the bank has to allow the customer interest on the funds involved for the period which must elapse before payment is made in the foreign centre. Thus the rate charged for M/T is calculated from the Market's selling rate for T.T. by making an allowance for the selling banker's profit, and for interest at the rate allowed on banker's funds in the place of payment, since the banker who sells M/T ordinarily covers himself by purchasing T.T. on the same centre, and thus has the use of the funds in that centre until the M/T is presented and paid.

"Guaranteed" Mail Transfers.—The period for which the dealer allows interest in the calculation of the rate for M/T will depend on the distance between the centres, on the time of the next outgoing mail, on the time taken in transit, and on the period which must elapse before the mail is "cleared" in the foreign centre: i.e., the period depends on the total time which must elapse between the date of the receipt of sterling in London and the date on which the dealer's currency account abroad is debited with the payment to the beneficiary.

The dealer works on the best information at his disposal as much for his own protection as for that of his customer, but, in estimating the time of delivery of a foreign mail, the possibility of miscalculation has always to be reckoned with, and either buyer or seller of M/T for large amount may suffer unexpected loss or receive an unexpected profit if the mail is delivered a day or so earlier or later than is anticipated. For this reason, it has become the practice in the London market for dealers to sell *Guaranteed Mail Transfers*, whereby they guarantee to make payment in a foreign centre on a stated date, irrespective of the time of arrival and delivery of the mail, in return for payment of sterling at a fixed rate of exchange. The seller ensures that payment in the foreign centre shall be made on the agreed date

by advising his agent by cable, sometimes sent at "deferred" (i.e., cheaper) rates, thus obviating the possibility of mail delays.

The advantages of the guaranteed mail transfer are that both seller and buyer know precisely when payment in the foreign centre will be made, and the seller can calculate exactly the "spread", or difference, between his T.T. rate and the rate to be applied to the M/T. It also enables payments to be made in the course of the usual mailing period, though, in fact, no mail is due to leave in the immediate future, and has special advantages in connection with the short-term investment of funds, since the parties can calculate the period involved with absolute certainty.

Example 3.—Calculate what price you will charge for a G.M.T. for $100,000 on New York, if the Market quotes spot dollars at $4\cdot86\frac{49}{64}-\frac{51}{64}$, and you allow interest at 5 % (New York rate) for 10 days, and your profit at $\frac{1}{64}$th in the rate.

Solution :—

If a G.M.T. is to be *sold*, the dealer will base his selling rate on the rate at which he can cover by *buying* T.T. in the Market, i.e., $\$4\cdot86\frac{49}{64}$ (the Market's selling rate). Therefore:—

Dealer's selling rate for dollars is $\$4\cdot86\frac{49}{64}$, *less* his profit, $\frac{1}{64}$th, viz., $\$4\cdot86\frac{3}{4}$	$\$4\cdot8675$
Plus interest for 10 days @ 5 %	·00676
	$\$4\cdot8743$

Say, $\$4\cdot87\frac{27}{64}$

[NOTE the customer is granted an *allowance* in respect of the interest.]

$$\text{Sterling equivalent} = £\frac{100{,}000}{4\cdot87\frac{27}{64}} = \frac{100{,}000}{4\cdot87421875}$$

$$= £20{,}516\ 2s.\ 2d.$$

Settlement by Debtor's Remittance of Sight Draft or Cheque.—The additional expense of payment through a bank by T.T. or M/T may be avoided if the debtor remits the amount due in the form of a banker's cheque or sight draft payable in the creditor's country and in his currency. The remittance is paid for by the debtor at the short exchange (the rate being usually the same as that for M/T)

and, on being received through the post by the creditor, is encashed by him at the drawee bank.

If the draft thus remitted is in the debtor's currency, the creditor will obtain the equivalent in his own currency from the drawee banker either at the prevailing rate for such drafts, or at a rate determined in accordance with an exchange clause embodied in the instrument. (See *ante*, Chapter VII.)

Calculation of the Short or Cheque Rate.—In some centres, e.g., New York, the majority of rates officially published each day are for cheques or demand drafts, and, wherever such a rate exists for the currency required by a remitter in the form of a draft, business can be effected at that rate. In London, however, most market rates are for T.T., and, unless a cheque rate exists (as, of course, it does in the case of important centres like New York), the dealer must calculate the rate to be applied in the purchase or sale of cheques, short bills and demand drafts by allowing interest off or on the T.T. rate for the time which must elapse between the issue of the cheque or draft, and the date of its presentment for payment to the drawee.

The interest will be calculated, as in the case of M/T, at the rate ruling in the foreign centre in which the cheque or draft is payable, and the time will, of course, vary with the period usually taken by the mail and the date of the next outgoing mail from this side to the centre concerned. Hence, the "spread" between the rate for T.T.'s or cable transfers and the rate for cheques and demand drafts (sometimes called the *cheque margin*) necessarily widens with any increase in the rate of interest ruling in the foreign centre concerned, and with any extension of the time taken by the mail to that centre.

It is important to notice that the banker's rate for *buying* cheques (or M/T) is calculated on a different rate of interest from that used when he is *selling* a cheque. In the latter case he adds to the T.T. rate an allowance for interest at the rate allowed *on his deposit* in the foreign centre; but when asked to *buy* a cheque, he works on the basis that he will have to cover by *selling* a T.T., and so incur an overdraft in the foreign centre: he therefore adds interest at the rate charged *for an overdraft* in the foreign centre. Hence we may say that the banker's cheque margin for *selling* is based on the rate of interest for call money or short deposits, whilst his cheque margin for *buying* is based on the *overdraft* rate.

If the rate for T.T. is in foreign money per £1, the cheque rate, being for a "worse" remittance, will be higher. Hence, if a banker is asked to *sell* a cheque, the allowance for interest must be *added* to

the Market's selling rate for T.T., while his usual allowance for profit must be *deducted*.

The sight and cheque rates are the same, because a sight draft, like a cheque, is payable on demand. The 8 days' rate on London (quoted by Berlin before the War, and by Paris and other centres nowadays, and known over there as the "Short Rate") allows, of course, for 11 days' interest, which includes the 3 days' grace allowed in England for the payment of the bill or draft.

It may be observed, at this point, that the extending use of air mails for commercial purposes has caused some difficulty to bankers in connection with the issue of sight drafts and cheques, for the reason that, in a number of cases, drafts have been forwarded by air mail and presented for payment to the foreign agent before receipt of the issuing banker's advice, which has been despatched by ordinary mail. Nowadays, therefore, banks charge less favourable rates for drafts which are to be advised and forwarded by air mail, owing to the loss of interest and extra postage involved.

This position may be illustrated by reference to the rates quoted by London on Paris, Amsterdam and Brussels. Between these centres the mailing time is so short that cheques and demand drafts for small amounts are usually sold to customers at the same rate as is charged for T.T.

In the case of large amounts, however, there is generally a spread between the cheque and T.T. rates depending on the relative value of money in the two centres concerned, and the use of the air mail between the centres has led to the curious anomaly of the cheque rate being at times *dearer* than the T.T. rate. To understand how this position arises, we must remember that, in London, T.T.'s on Paris and Amsterdam are normally value *two* days ahead, whereas cheques are paid for in sterling on the *day after dealing*, and, if they are sent by air, can be cashed in Paris on that day, i.e., on the day after purchase in London. Consequently, the spread between the T.T. and cheque rates on these centres for large sums must, in certain circumstances, allow for one day's interest *in favour of the seller* of the cheque. For example, suppose that when day to day money is worth 4½ % in London and 6½ % in Paris, a London dealer sells cheque on Paris for Fcs. 250,000. He covers by the purchase of T.T. value two days ahead, but the cheque is presented by air mail and paid on the day after it is sold to the customer. Consequently, the dealer is "out of" francs for one day, costing him 6½ %, while he is "in" sterling for the same period, gaining 4½ %. He must therefore cover himself in

the rate quoted for the cheque in respect of the difference of 2 % interest charged to him in Paris, making the cheque rate to that extent *dearer* than the T.T. rate.

Example 4.—How much will a banker charge for a sight draft on Amsterdam for Fls. 5,254·16, market rates for sight drafts being 12·12–·13, allowing for the bank's profit at 1 per mille.

Solution :—

Market selling rate	..	..	12·12
Less bank's profit	..	..	·01212
			12·10788

Rate quoted to customer, say, $12 \cdot 10\frac{3}{4}$.

$$\text{Sterling cost of draft} = £\frac{5{,}254 \cdot 16}{12 \cdot 1075}$$

$$= £433\ 19s.\ 2d.$$

Example 5.—For what amount would you issue a draft on France against payment of £1,000, the market rates for sight drafts being 124·15–·20, your profit 1 per mille?

Solution :—

Market selling rate for sight drafts		..	124·15
Less bank's profit	..	..	·12415
			124·02585

Rate quoted to customer, say, Fcs. $124 \cdot 02\frac{1}{2}$ per £1.

Amount of draft = Fcs. 124,025.

Example 6.—For what amount would you issue a draft on Portugal against payment of £445 12s. 6d., market rates for sight drafts being 110–$110\frac{1}{2}$, your profit 1 per mille?

Solution :—

Market selling rate for sight draft		..	110·00
Less bank's profit	..	..	·110
			109·890

Say, $109\frac{3}{4}$.

$$\therefore \text{Amount of draft} = £445 \cdot 625 \times 109 \cdot 75$$

$$= 48{,}907 \text{ escudos.}$$

Example 7.—The Market quotes dollars at \$4·86 $\frac{13}{16}$–$\frac{15}{16}$. What rate would your bank dealer apply on the sale of a cheque on New York, if he allows profit at $\frac{1}{4}$ per mille, and interest at 4 % for 10 days?

Solution:—

Dealer's selling rate for T.T. is	4·868125
Less his profit at $\frac{1}{4}$ per mille	·001218
i.e., ...	4·866907
Add interest for 10 days @ 4 %	·00541
Sight rate on New York	4·87232

Rate quoted to customer = \$4·87$\frac{7}{32}$.

Example 8.—Your bank dealer is willing to deal in T.T. Buenos Aires at 47$\frac{7}{16}$–$\frac{1}{2}$, and is asked to sell a cheque on that centre for 100,000 pesos. What rate will he apply if his funds earn 6 % in Buenos Aires, and he allows 15 days for postal transmission?

Solution:—

His selling rate for T.T. is	47·50 pence.
Less interest which he must allow the customer for approximately 15 days @ 6 %	·117
	47·383 ,,

Say, 47$\frac{25}{64}$d. per gold peso.

Example 9.—For what amount would you issue a sight draft for Fcs. 20,000 on Paris, the T.T. rate being Fcs. 124·13–·15, your margin 1 per mille?

Solution:—

Market selling rate for T.T.	Fcs. 124·13
Less margin 1 per mille	·124
Sight rate	Fcs. 124·006

Rate quoted to customer = Fcs. 124 per £1.

$$\text{Sterling payment required} = £\frac{20{,}000}{124}$$

$$= £161\ 5s.\ 10d.$$

Example 10.—How much would a London banker give for a sight draft on New York for \$700, when the market rates for T.T. are \$3·46$\frac{13}{16}$–$\frac{15}{16}$, the interest rate ruling on bankers' funds in London is 3 % per annum, the rate for bankers' deposits in New York is

2½ % per annum, and the rate charged on an overdraft by the banker's New York agent is 3½ % per annum? Allow ¼ % for the banker's profit. Mailing period is ten days.

Solution:—

The banker will cover by selling T.T. in the market at $\$3 \cdot 46\frac{15}{16}$.

Rate for T.T.	$\$3 \cdot 469375$
Add interest @ 3½ % for 10 days ..	·003373
[New York terms: 360 days]	
Banker's profit, ¼ %	·008673
	3·481421

Rate quoted to customer: $\$3 \cdot 48\frac{1}{4}$ (to nearest eighth above)

$$\$700 \text{ @ } \$3 \cdot 48\tfrac{1}{4} = £\frac{700}{3 \cdot 4825}$$

∴ Banker pays £201 0s. 1d. for the draft.

Settlement by Creditors' Sight Draft.—Very frequently, it is arranged that the initiative in regard to the settlement of a trade debt shall be taken by the creditor, who will draw either at sight or by long bill on the debtor direct, or under a letter of credit on a bank in the debtor's country or on a bank in his own country. The bill so drawn may be expressed in the currency of the creditor's country, or, as is more usual, in the debtor's currency, or, as is frequently the case between countries of relatively less importance, in an international currency such as sterling or the United States dollar.

If the creditor obtains payment by a sight bill in his own currency, he will either turn the draft into cash at once by selling it to a banker for its face value less discount for the mailing period outwards and homewards, or he may hand it to the latter for collection and credit of the proceeds in due course.

If the creditor lives in England, he will probably draw his bill in sterling and insert therein an exchange clause in one of the forms which are customarily used. By so doing he makes certain of obtaining the exact amount due to him, less a small charge for the negotiating banker's commission or profit, and fixes the rate of exchange at which the bill shall be ultimately paid by the foreign drawee. If the bill is drawn "Exchange as per endorsement," the creditor will receive the full sterling amount of his draft; the rate will be specified on the bill by the negotiating banker on this side, the amount of the instru-

ment will be converted at this rate and the bill will thereafter function as if it were originally drawn in the foreign currency concerned.

If the creditor draws at sight or on demand on his debtor in the latter's currency or in another foreign currency, the amount paid to him in his own currency by the negotiating banker will be determined by a simple conversion at the rate of exchange applicable to the class of remittance to which the draft belongs, the banker seeing that he is covered in the rate for his own profit.

If the draft is sold in a centre which quotes a cheque rate or sight rate in the foreign currency concerned, the conversion will, of course, be effected at that rate. In London, however, the short rate to be applied must first of all be calculated from the T.T. rate, due allowance being made, in the manner already explained, for interest for the estimated period during which the negotiating bank will be out of its funds (calculated at the overdraft rate in the foreign centre) and for the bank's profit, if that is not already covered in the T.T. rate.

Example 11.—How much will a bank in Paris pay for a sight draft on London for £676 17s. 6d., the market rates for cheques being 123·98–124·03? Allow the negotiating bank a profit of 5 c. in the rate.

Solution:—

Market buying rate for sight drafts ..	123·98
Less bank's profit	·05
Rate to be applied	123·93

Proceeds = Fcs. 676·875 × 123·93
= Fcs. 83,885·11.

Example 12.—What would you give for a demand draft on Milan for lire 97,265, if the market rate is 92–92$\frac{1}{16}$, your bank's profit $\frac{1}{10}$ of 1 %, the time taken 4 days and interest in Milan 4 %?

Solution:—

Market buying rate for T.T...	92·0625	lire.
Add Profit 1 per mille	·09206	,,
Interest, 4 days at 4 %	·04036	,,
Banks' buying rate for sight drafts ..	92·1949	,,

Say, 92·20 lire per £1.

Amount paid for draft = £$\frac{97265}{92·2}$

= £1,054 18s. 8d.

Example 13.—What amount in sterling would you give for a bill of exchange on demand drawn on Warsaw for 5,000 zlotys, if the rate is 43·20–25, and you allow Zl. 3 per Zl. 1,000 for stamp duty on demand bills in Poland and $\frac{1}{16}$ % for your collection charges?

Solution: —

Amount of bill		Zl. 5,000
Stamps		15
		Zl. 4,985
Rate for buying	Zl.	43·25
Plus $\frac{1}{16}$ %		·027
		43·277

Rate applied to the bill, say, Zl. 43·28.

$$\text{Sterling proceeds} = £\frac{4{,}985}{43\cdot28}$$
$$= £115\cdot18$$
$$= £115\ 3s.\ 7d.$$

Settlement by Creditor's Long Bill.—The procedure is not quite so simple when the parties agree that settlement shall be effected by a long bill drawn by the creditor on the debtor. In order to illustrate the position, we will assume that a London merchant imports goods from America to the value of £1,000 (including expenses on that side) and that, the short exchange being $4·865 per £1, the parties arrange that the creditor in New York shall obtain payment by drawing on the British importer at three months *after sight* for the amount due.

Clearly, the creditor who draws a three months' bill for £1,000 on London is faced with two alternative ways of obtaining payment: (*a*) He may hand the bill to his banker and instruct the latter to present it for acceptance in London, and to collect the proceeds at maturity in due course; (*b*) He may discount the bill with his banker, thereby obtaining its true present worth (i.e., its face value less discount for three months), and leaving it to the banker to present the bill for acceptance and to collect the proceeds in due course.

Let us assume that the second method is adopted and that the bill is sold to a banker in New York. Now the question arises: What rate of exchange is the negotiating banker to apply to a three months' bill on London if the short exchange is $4·865 per £1?

If we assume that the banker can cover himself at this rate, he must make allowances thereon which will recompense him (*a*) for

being out of his money for three months, i.e., for interest lost until the proceeds of the bill are credited to him on its maturity; (*b*) for the amount of stamp duty which his London agent will have to pay before he can obtain payment or otherwise deal with the bill on this side; (*c*) for the risk involved in dealing with an instrument which does not fall due for payment for some time, during which period the position of the parties may change unfavourably, and (*d*) for his trouble in handling the instrument, presenting it for payment and collecting the proceeds in due course.

To the banker in New York, a three months' bill on London is not as good as a bill involving immediate payment, hence he will expect to buy it at a *cheaper* price in dollars, i.e., at a *lower* rate of exchange. The banker will therefore build up the *long rate of exchange* which he will apply to the bill by *deducting* the various allowances from the short rate. He will first of all deduct discount at the rate *ruling in the place where the bill is payable*, i.e., London, this rate being applied for the reason that, if he should subsequently require to convert the bill into cash before its maturity, he must send it to his London agent for presentment for acceptance and rediscount, whereupon discount will be charged at the rate ruling in London.

In this connection we must bear in mind that, if the parties are first-class financial houses or banks, the rate for first-class bills at the place of payment will be charged, but otherwise the commercial bill rate, which is higher, will be applied.

Secondly, the New York banker will deduct $\frac{1}{2}$ per mille for the English adhesive stamp duty (1s. per £100), and, finally, he will allow about another $\frac{1}{2}$ per mille for charges and contingencies. On this basis, the *long rate of exchange* to be applied to the three months' bill would be calculated somewhat as follows:—

Buying rate for cheques, New York on London ..	\$4·865	
Less discount for three months at, say, 5 % (London rate) ..	·060813	
Allowance for stamps, $\frac{1}{2}$ per mille	·002433	
Allowance for contingencies, $\frac{1}{2}$ per mille	·002433	
	———	·06568
Three months' buying rate		4·79932

Nearest commercial rate: \$4·79$\frac{15}{16}$.

It is assumed in this example that the banker's profit is already included in the short rate, but, if this is not the case, a further $\frac{1}{32}$ to $\frac{1}{16}$ c. in the rate would be deducted by the banker in arriving at the long rate, making the latter about \$4·79⅞. Furthermore, if the long rate were based on the T.T. rate, the allowance for discount would have to be extended to allow for the mailing period. On the other hand, if the long bill were drawn payable three months *after date*, and the long rate were based on the T.T. rate, *no* account would need to be taken of the mailing period, since the bill would be paid exactly three months after its *date*, whereas with a three months' *sight* bill the three months does not begin to run until the bill has been sent abroad and accepted.

Thus, by drawing a three months' bill for £1,000 in place of a sight bill, the creditor realises \$4,799·37 instead of \$4,865 by the latter method. His position is no better if he forwards the bill for collection instead of discounting it, for, in such a case, he will be out of his money during the currency of the bill, and be required to pay the foreign stamp duty and the collecting banker's charges. Obviously, no creditor would be content to accept payment by long bill on this basis unless he were otherwise covered in the price at which the goods were sold. In the majority of contracts for the sale of goods, the price quoted by the seller allows for the fact that the buyer will require three months' credit, and in such cases the creditor is not penalised by drawing at three months' date or sight for the exact amount of his invoice, plus any charges incurred on the buyer's behalf. But if no arrangement exists for the granting of credit, the seller is more likely to arrange with his debtor that he shall draw his three months' bill for an amount in sterling which, on negotiation, will yield approximately the same amount in dollars as he would obtain if a sight draft were drawn for the amount due. In such circumstances he would calculate the amount of his long bill as follows:—

Value of Goods	£1,000	0	0
Add three months' interest @ 5 %	12	10	0
,, Allowance for stamp duty, ½ per mille		10	0
,, Charges and contingencies, ½ per mille		10	0
Amount of three months' bill on London ..	£1,013	10	0

If we assume that the sight rate remains at \$4·865, this bill for £1,013 10s. would be sold at the three months' rate calculated above, viz. \$4·79$\frac{15}{16}$, and would yield approximately the same amount in

dollars as the creditor would have obtained if he had drawn for £1,000 at sight and sold at 4·865, i.e.:—

$$£1{,}013\cdot5 \text{ @ } 4\cdot79\tfrac{15}{16} = \underline{\$4{,}864\cdot17}$$

Calculation of Long Rates from Short Rates.—The long rate of exchange—which is generally understood to mean the *three* months' rate—is calculated from the short rate or T.T. rate by adding, or deducting, as the case may be, allowances for:—

(*a*) Interest, for the time which must elapse before payment of the bill, at the *foreign* discount rate for the class of bill concerned.
(*b*) *Foreign* stamp duty, usually about ½ per mille.
(*c*) Agent's collecting commission or charges, together with a small allowance for risk and contingencies involved in waiting for the money, usually totalling about 1 per mille or ⅛ %.
(*d*) Banker's profit or commission, if this is not already included in the short rate, usually, say, ⅛ %.

The calculation of the allowances is simple enough. The difficulty lies in ensuring that they are made in the *right direction*, but this difficulty will at once disappear if it is remembered that the long rate is always *cheaper* than the sight rate because it represents money in the future instead of money at once. Hence, if we are operating in this country, we apply to rates in *foreign* money the oft-quoted maxim: "*The better the bill, the lower the rate*," adding the allowances to the sight rate in foreign currency, and thus making the long rate the higher of the two. On the other hand, we *deduct* the allowances if we are dealing with a rate in sterling, making the sterling price of the long bill lower than the price of a short bill. Thus the charges are always deducted from the short rate in calculating a long rate if the rates are expressed in the "*home*" currency, "home" here meaning England, or France, or Japan, or any other centre in which we imagine ourselves to be dealing at the moment.

Bankers' Profit or Commission.—This item requires special care if it is to be allowed for, since it is not always made in the same direction as the other charges. If a dealer is *buying* long bills expressed in a foreign currency and wishes to allow for a profit of, say, ⅛ %, he must, of course, *add* this to the calculated rate before he effects the conversion into his own currency ("Buy high"). On the other hand, if he is selling a long bill and is working from a short rate in foreign money, he must *deduct* his profit ("Sell low"). The converse is true if the rates are in the dealer's home currency.

Days of Grace.—Allowance for days of grace must be made on bills on any country wherein they are allowed, since it may be taken for granted that the debtor will not usually pay a bill drawn upon him until the last possible moment.

It may be observed that three days' grace are allowed in Canada on bills drawn at sight and after sight, but not on bills payable "on demand". As a rule, bills on the United States take no days of grace, but three days' grace are allowed on after *sight* drafts payable in North Carolina, New Hampshire, Rhode Island and Massachusetts.

"After Date" and "After Sight" Bills.—Great care is also required in applying a long rate to a bill of exchange payable at so many days or months *after sight*, i.e., after it is first seen by the drawee. In the case of a bill payable *after date*, the term begins to run from the date written on the instrument, so that the rate to be applied to such a bill is calculated directly from the T.T. rate. merely by making the requisite allowances, including interest for the unexpired period of the bill. In the case of an *after sight* bill, the term does not begin to run until the *date of sighting*, and, in dealing with such a bill, therefore, the negotiating banker must obviously cover himself in respect of interest lost during the time which must elapse before the bill can be presented for acceptance, i.e., the mailing period. This will vary according to the distance between the centres concerned, according to the date of the next outgoing mail, according as the mail is sent by a fast vessel, or by air, and so on.

Between London and New York, from eight to ten days must be reckoned for transmission, between London and Paris two days,* London and Lisbon three days, and so on. But this additional allowance will be made only if the banker is basing the rate to be applied to a sight bill on *the T.T. rate*, as is the case in London, where practically all quoted rates are for T.T.s. But in other centres, where short or cheque rates are regularly quoted, the allowance for interest lost during transmission will have been already made in the cheque rate or short rate, and, in such circumstances, the long rate for bills *after sight* is invariably calculated with the quoted cheque rate or short rate as the basis, interest being taken into account only for the period of the bill, and the period of transit being ignored.

Example 14.—Cheques on Paris are quoted in London at Fcs. 124·15–·25 per £1, and the commercial bill rate in Paris is 4 %.

* I.e., by ordinary post. *One* day only is allowed if the remittance is forwarded by *air* mail.

Allowing ½ per mille for stamp duty, ½ per mille for risk, and ½ per mille for the negotiating bank's profit, calculate the long rate to be applied by a London dealer in purchasing three months after *sight* trade bills on Paris.

Solution:—

Market buying rate for cheques on Paris ..	Fcs.	124·25
Add 3 months' interest at 4 % per annum		1·2425
French stamp duty, ½ per mille Allowance for risk, etc., ½ per mille		·1242
Bank's profit, ½ per mille		·0621
	Fcs.	125·6788 per £1

Long rate on Paris = Fcs. 125·68 per £1.

Example 15.—Market discount rate in London is 7 %, in Berlin 6 %. Assume that a banker is willing to deal in T.T. on Berlin at Mks. 20·53–·56 per £1. Calculate his long rate for purchasing "best paper" on Berlin, payable three months after *date*, allowing 1 per mille for stamp and risk.

Solution:—

T.T. buying rate	Mks.	20·56
Add 3 months' interest at 6 % (Berlin)		·3084
Allowance for risk and stamp duty		·0206
	Mks.	20·889

Long rate = Mks. 20·89 per £1.

NOTE.—This rate will be applicable only on the date of the bill. If some days of the three months have already run, a slightly *lower* rate would be quoted. (See Examples 39–42.)

Example 16.—A New York banker is willing to deal in cheques on London at $4·85\frac{1}{8}-\frac{5}{16}$ per £1. Discount in New York is 8 %, in London 7 %. Allowing, say, 2 per mille for contingencies and English stamp duty, find the rate he will quote for the purchase of London bills at three months' sight.

Solution:—

As we are operating in New York, rate is in the *home* currency, so deduct charges for the cheaper rate:—

Buying rate for sight drafts			$4·85125
Less 3 months' int. at 7 % ..		·08489	
Allowance for stamp, etc. ..		·00970	
			·09459
			$4·75666

Say, $4·75\frac{21}{32}$ per £1.

The cheaper bill sells for less dollars per £1.

Example 17.—New York quotes T.T. on London as $4·86\frac{1}{2}-\frac{3}{4}$; interest on overdrafts in London is 4 % and discount on trade bills in London is 5 % per annum. Assuming that the time of mail from New York to London is 10 days, what rate would a New York banker apply on the purchase of (*a*) a cheque on London; (*b*) a 60 days' commercial sight draft on London, if he allows his profit at 1 per mille and English stamp duty on long bills at $\frac{1}{2}$ per mille?

Solution:—

Buying rate for T.T. on London			$4·865
Less 10 days @ 4 %		·00533	
Profit at 1 per mille		·004865	
			·010195
Buying rate for *cheques* on London			$4·854805
Say, $4·85\frac{15}{32}$.			
Deduct 63 days @ 5 %		·041897	
Stamps @ $\frac{1}{2}$ per mille		·002427	
			·044324
Buying rate for 60 d/s drafts on London			$4·810481

Say, $4·81 per £1.

The more usual method of calculating the 60-day rate is to take the T.T. rate and to deduct therefrom 73 days' interest at the discount rate, *plus* the allowance for stamp duty, viz.,

Buying rate for T.T. on London			$4·865
Less 73 days' interest @ 5 %		·04865	
Stamp duty @ $\frac{1}{2}$ per mille		·002432	
Banker's profit @ 1 per mille ..		·004865	
			·055947
			$4·809053

Buying rate for 60 d/s drafts = $4·80\frac{29}{32}$ per £1.

The latter method is not, of course, so favourable to the seller if the discount rate is *higher* than the rate charged to the banker for an overdraft.

If the banker is asked to *sell* a demand draft or 60 days' bill on London in sterling, he makes the allowance for interest in the usual way, but he *adds* the amount of his profit (see Example 30).

Example 18.—At what rate would you purchase from a customer a three months' after date bank bill on Milan for lire 150,000 if the market quotation in London for T.T.'s on Milan is 92·15–·20, and market rates of discount are: 5¼ % per annum in London, and 6 % per annum in Milan?

Allow for Italian stamps ½ per mille and for your profit 1 per mille. Neglect English stamps and assume that the bill has exactly three months to run.

Solution:—

Market T.T. rate, London on Milan (buying) ..	92·20	lire.
Add 3 months' interest @ 6 %	1·383	
Stamp @ ½ per mille	·0461	
Profit @ 1 per mille	·0922	
Long Rate	93·7213	„

Say, lire 93·72¼ per £1.

Example 19.—At what rate of exchange would a London dealer purchase from a customer a draft on New York at 90 d/s, if he is willing to deal in cheques on New York at 4·85–·86, and the discount rate in New York is 5 %. There are no days of grace or stamp duties in New York, and discount is, in practice, calculated on 360 days to the year. Allow 1 per mille for risk, etc.

Solution:—

Buying rate for cheques	$4·86
Add 90 days' interest @ 5 % $\frac{4·86 \times 90 \times 5}{360 \times 100}$	·0608
Risk, etc., 1 per mille	·0049
	$4·9257

Say, $4·92\frac{19}{32}$ per £1.

OBSERVE the custom ruling in the United States of calculating interest and discount on the basis of 360 days to the year.

Example 20.—A customer has to draw in U.S.A. dollars at 90 days' sight on a bank in San Francisco, under a Letter of Credit, such draft having to be accompanied by full set of shipping documents. He presents his draft and documents, apparently in good order, to you, and asks you to negotiate the draft. Given the following data, what rate would you quote him?

Market discount rates in London 5¼ %; in San Francisco 5 %; U.S.A. stamp duty, negligible; agent's charge for handling documents ½ per mille, bank's profit $\frac{1}{16}$ %; transit from London to San Francisco 14 days; London market quotation for T.T. San Francisco 4·86½–⅝. There are no days of grace.

Solution:—

Buying rate for T.T. on San Francisco	\$4·86625
Add Bank's profit @ $\frac{1}{16}$ %	·00304
Agent's charges @ ½ per mille	·00243
Discount, 104 days @ 5 %	·07029
(New York terms: 360 days = 1 year)	
	\$4·94201

∴ Negotiating rate to be applied is \$4·94$\frac{7}{32}$ per £1.

NOTE.—As this rate is being applied to a transaction with a customer and not with the Market, it is given to the nearest $\frac{1}{32}$ and not to the nearest $\frac{1}{64}$ (\$4·94$\frac{13}{64}$).

Example 21.—On the 22nd November a customer presents to you for discount a bill for Fcs. 125,000, payable in Paris and due on the 1st January following. If the T.T. rate on Paris is quoted in the London Market as 124·15–·25, at what rate would you discount the bill, allowing $\frac{1}{16}$ % as your profit, and with how much sterling would you credit the customer's account for the proceeds? Paris discount rate 4½ %. There are no days of grace in Paris.

Solution:—

Market buying rate for T.T.	Fcs. 124·25
Dealer's profit @ $\frac{1}{16}$ %	·07766
Dealer's buying rate for T.T.	124·32766
Add allowance for interest, viz., 40 days @ 4½ %	·61312
	Fcs. 124·94078

$\therefore$ Rate to be applied = say, Fcs. 124·94 per £1.

$$\therefore \text{ Sterling equivalent} = £\frac{125{,}000}{124 \cdot 94} = £1{,}000\ 9s.\ 7d.$$

To Find Long Rates at Two Centres.—A useful arithmetical exercise is to calculate the long rates in two centres when rates in each are given. Great care has to be taken to see that the correct discount rate is used, and also to allow the charges in the right direction.

Example 22.

London on Paris T.T. buying rate is Fcs. 124·25.
Paris on London T.T. buying rate is Fcs. 124·20.
Discount rate for trade bills in Paris is 5 %, in London 4 %.
Allowance for risk 1½ per mille, stamp ½ per mille.
Find banks' buying rates in both centres for trade bills payable three months after date.

Solution:—

London on Paris T.T. rate		Fcs. 124·25
Add 3 months' int. at 5 % (Paris)		1·5531
Allowance for risk and stamp at 2 per mille		·2485
		Fcs. 126·0516

Long rate on Paris = Fcs. 126·06 per £1.

Paris on London T.T. rate		Fcs. 124·20
Deduct 3 months' int. at 4 % (London)	1·2420	
Allowance for stamp and risk, 2 per mille	·2484	
		1·4904
		Fcs. 122·7096

Banks' long rate on London = Fcs. 122·70 per £1.

We add charges in London, but deduct them in Paris, because, in London, Fcs. 126·06 are cheaper to buy per £1 than Fcs. 124·25, whereas in Paris it is cheaper to give Fcs. 122·70 per £1 than to give Fcs. 124·20.

Also:—

We add charges in London, because

More francs should be received in three months' time than if they were received now; and

We deduct them in Paris, because

Less francs will be paid to-day for sterling due in three months' time than if it were due to-day.

Example 23.

London on Rio, T.T. buying rate is $5\frac{3}{4}$ pence per milreis.
Rio on London, ,, ,, ,, $5\frac{13}{16}$,, ,,
Discount rates for trade bills, London 6 %, Rio 8 %.
Allowance for risk and stamp. say, $\frac{1}{64}$d. in the rate.
Find long rates for trade bills payable 3 months after date.

Solution:—

London on Rio, T.T. buying rate			5·75
Deduct 3 months' interest at 8 %		·1150	
Allowance for risk and stamp ..		·0156	
		———	·1306
			5·6194

London buying rate for long bills = $5\frac{39}{64}$ pence per milreis.

Rio on London, T.T. rate				5·8125
Add 3 months' interest at 6 %				·0872
Allowance for stamp and risk				·0156
				5·9153

Buying rate for long bills on London = $5\frac{29}{32}$ pence per milreis.

Note carefully that when rates are quoted in *the same way* in both places, then if we add charges in one place we must deduct them in the other. If, however, the rates are quoted in different ways, i.e., one in sterling and the other in currency, we add or deduct, as the case may be, *in both cases*. None of these calculations should cause any difficulty if it is clearly understood that, in whichever place we may be dealing, that rate of exchange is dearer which compels us to give more of the home currency, or the currency of the place in which we consider ourselves to be, for each unit of foreign currency which we buy.

Short Rates from Long Rates.—Although of little practical utility, another useful theoretical exercise is to reverse the process illustrated above, and calculate the short rate if the long rate is given. This simply involves an application of the foregoing principles in the reverse order, that is to say, wherever charges are added in the above examples, they must now be deducted, and so on.

Example 24.—Assume that a bank in Buenos Aires is willing to buy long bills on London (best paper) at $47\frac{3}{4}$ pence per peso, and that market discount in London is 8 %. Find the rate likely to be quoted

by the same bank for buying cheques on London, giving the seller an allowance of 1 per mille for the smaller risk, etc.

Solution:—

Long rate on London		..	47·75 pence.
Deduct 3 months' int. at 8 % ..	·955		
Allowance, 1 per mille ..	·048		
	——	1·003	
		46·747	,,

Short rate = $46\frac{3}{4}$ pence per gold peso.

Settlement by Debtor's Long Bill.—Although the practice is becoming increasingly less common, remittances from certain countries (especially the Dominions) are made by means of *long* bills (almost invariably bankers' drafts) payable in the creditor's country and currency. The amount of such a bill is determined by precisely the same considerations as we have discussed in relation to long bills drawn by the creditor. If the creditor has agreed to accept payment by long bill, and to wait for his money until the bill matures, the debtor has merely to purchase from his banker a draft of the required term and amount, paying for it at the long rate of exchange applicable to the class of remittance concerned. If, on the other hand, the debt due to the creditor is payable *immediately*, the face value of the long bill or long bills remitted by the debtor must be sufficient to cover the amount owing, as well as the amount of discount and other charges incurred by the creditor on the conversion of the bills into cash. This will be clear on considering the following illustration:—

A London merchant owes a French creditor a debt of Fcs. 124,000 *payable immediately*. The short rate of exchange is 124, and consequently a sight bill for the requisite amount would cost £1,000. If, however, long bills are sent, the total amount in francs must be such that the French creditor can obtain Fcs. 124,000 by immediately discounting the bills and paying any necessary charges. As the long rate on France is *higher* than the short rate by the amount of the allowance for interest and charges, it is clear that £1,000 invested in bills at the long rate should yield the creditor approximately the same as £1,000 invested in a sight draft.

For example, with a short rate of 124 the long rate might be 125·5, in which case £1,000 would purchase Fcs. 125,500, Fcs. 1,500 more than could be obtained by the short rate for the same amount in sterling. This additional amount of Fcs. 1,500 would just about cover the cost to the creditor of discounting, stamp duty and other charges.

With this explanation the following illustrative examples should be clear to the reader. Banker's profit is charged as in the case of sight drafts, but considerable care must be exercised in making allowances for stamp duties. Where a banker in London is asked to *sell* a long bill he must recoup himself for the cost of stamping the bill; hence, he will add the amount of stamp duty to the sterling amount to be charged for the draft. The cost of *foreign* stamps will in each case be ignored, since it falls on the customer's shoulders.

Example 25.—Buenos Aires quotes London short at $47\frac{1}{2}$–$47\frac{3}{4}$ pence per peso. Market discount rates, London 8 %, Buenos Aires $7\frac{1}{2}$ %. Allowing $\frac{1}{2}$ per mille for Argentine stamp duty, $\frac{1}{8}$ % for the selling bank's profit, calculate the rate at which a bank in Buenos Aires will be willing to sell three months' *sight* bills on London.

Solution:—

Selling rate for cheques on London		47·5d.
Add Interest for 3 months at 8 % (Market rate)		·95
		48·45
Deduct bank's profit at $\frac{1}{8}$ %	·06	
Argentine stamp, $\frac{1}{2}$ per mille	·02375	
	·08375	
		48·36625

Long rate = say, $48\frac{1}{4}$ pence per gold peso.

Example 26.—Assume that a London banker is willing to deal in T.T. on Monte Video at $49\frac{3}{4}$–$\frac{7}{8}$ pence per peso, that bank discount in London is 5 %, in Monte Video 4 %. Allowing 1 per mille for stamp and risk, find the rate he will apply to the purchase of commercial bills on Monte Video payable three months after *date*.

Solution:—

Buying rate for T.T. on Monte Video		49·75
Less 3 months' interest at 4 % ..	·4975	
Allowance for stamp and risk, 1 per mille	·0497	
	·547	
		49·203

Long rate on Monte Video = $49\frac{13}{64}$ pence per gold peso.

The long rate is cheaper, i.e., fewer pence are paid per peso.

It will be noticed that the allowances for stamp duty in this and the last example are made in each case *in favour* of the banker, despite the fact that in the one case he is buying, whereas in the other case he is selling. As a general rule it will be found that, wherever an allowance for stamp duty has to be made in one of these calculations, it is made *in favour of the bank.*

Thus, in Example 25, the banker in Buenos Aires is drawing a bill on London for the convenience of his customer, and he will naturally charge the customer with the stamp duty which has to be paid. Accordingly, he has charged this expense in his rate, though in practice he would be more likely to exclude this item from the calculation of his rate, and to add the actual cost of stamps to the price of the bill. His customer will have to bear the English stamp duty when he presents the bill in London, but the Argentine banker cannot grant an allowance for this expense, for to do so would mean cutting into his narrow profit margin.

In Example 26 the London banker charges his customer for the foreign stamp duty which he has to pay on the bill when it reaches Monte Video, but, as explained in the last paragraph, he makes his customer no allowance for the *English* stamp duty already borne by the latter.

It will be noticed also that when a banker is *selling* a long bill he makes no allowance to the buyer for risk or other charges; these items appear only in the calculation of a bank's *buying* rate.

Example 27.—I owe Fcs. 30,000, to be paid in three months in Paris. What is the cost of a three months' draft for payment of that amount if market T.T. rates are Fcs. 125·15–25, discount in Paris is 5 %, and my bank's profit 1 per mille?

Solution:—

Market T.T. rate (selling)	Fcs.	125·15
Less bank's profit, 1 per mille ..		·125
		125·025
Add 3 months' int. @ 5 %		1·563
	Fcs.	126·588
Rate charged by bank	Fcs.	126·58

	£	s.	d.
Fcs. 30,000 @ 126·58	237	0	1
Add stamps	0	3	0
Total cost of draft .. =	£237	3	1

Example 28.—What would a New York banker charge for a 60 days' sight draft on London for £1,000, if the T.T. rates in London are \$4·86½–¾ and discount rate in London is 5 % per annum? Allow ¼ c. in the rate for banker's profit but ignore American stamp duty. Mailing period is 10 days.

Solution:—

Market selling rate for T.T.		\$4·8675
Add profit		·0025
		4·87
Less 73 days' interest @ 5 %		·048675
		\$4·821325
Rate quoted to customer ..	\$4·82¼	
Charge for £1,000 draft	\$1,000 × 4·82¼	
	\$4,822·50.	

Example 29.

(*a*) A New York banker quotes the following buying rates on London:—

Cable, 3·51¼. 60 days, 3·50½.

If the difference in rates represents English stamp duty and interest only, at what rate (to nearest $\frac{1}{16}$ %) has the American banker calculated interest in arriving at his buying rate for 60 days' drafts? Mailing period, 10 days.

(*b*) In the above example, assume that the London discount rate moves to 1¼ % and adjust the 60-day rate accordingly.

Solution:—

(*a*) The cable rate is	3·5125
Deduct stamp duty at ½ per mille	·00175
	3·51075
Deduct 60 days' rate	3·505
Balance represents interest	·00575

The 60 days' rate is based on:—

60 days' usance
3 days' grace
10 days' mailing time
73 days

$$\therefore \text{ If on } \$3\cdot5125 \text{ for } 73 \text{ days interest is } \$\cdot00575$$
$$\text{on } \$100 \quad ,, \quad 365 \quad ,, \quad ,, \quad ,, \quad \frac{\$\cdot00575 \times 100 \times 365}{3\cdot5125 \times 73}$$
$$= \cdot8185$$
$$\text{Rate of interest} = \underline{\frac{13}{16}\% \text{ (to nearest } \frac{1}{16}\%).}$$

(*b*) The cable rate is .. .. 3·5125
Deduct stamps at $\frac{1}{2}$ per mille ·001756
Int. at $1\frac{1}{4}\%$ per annum ·008781
·010537
3·501963

$$60 \text{ days' rate} = \underline{\$3\cdot50\tfrac{3}{16} \text{ per £1.}}$$

NOTE.—This calculation is based on a 365-day year, i.e., the banker works the interest on "London terms," since the bill is payable in London. In the United States interest or discount *charged* is worked on the basis of a 360-day year, but is *added* on the basis of 365 days.

Purchase of Long Bills for Varying Terms.—When rates for long bills are published, they apply to bills having certain fixed periods to run, viz., three months, 90 days, 60 days, and so on. A little consideration will make it clear that the unexpired period of many long bills which are brought to a banker for sale or negotiation will not correspond with the period for which the rates are available. Many bills will have already run some part of the term for which they are drawn, whereas others will be drawn for longer periods than those to which the quoted rates apply.

In those centres which make a practice of quoting long rates, the quotations will apply only to the most common type of bill which the bankers have to handle, e.g., 60 days in New York, and as it would be almost impossible to quote prices to cover the varying periods of all the bills dealt with, adjustments have to be made at the time of sale to compensate for the interest gained or lost, as the case may be.

There are two possible methods of dealing with the necessary allowance:—

(*a*) In practice, the *price* at which the bill is sold, that is, the rate of exchange per unit, is increased or decreased by the amount of interest to be allowed.

(*b*) Another possible method, now seldom if ever applied in practice, is to calculate the value of the bill at the quoted rate available,

whether that is a short rate or a long rate, and to make a separate adjustment for the interest on the amount so calculated.

In the latter case we adjust the *principal*, but retain the same price, whereas in the former case we adjust the *price* and keep the principal the same.

"Tel Quel" Rates.—A rate of exchange adjusted by the *first* method is known as a *tel quel* rate, or an "all in" rate, because it is made to fit the bill "such as it is", and must be clearly distinguished from the adjustment of the principal made by the *second* method. The latter is *not* an example of a *tel quel* rate, since no special *rate* is calculated.

As in the case of the calculation of long and short rates, the *tel quel* rates should, where possible, be calculated to the nearest "step" by which the exchange varies, e.g., to the nearest $\frac{1}{2}$ centime for France, $\frac{1}{64}$ cent for U.S.A., etc., though, in practice, most of the bills will be for small amounts, so the nearest $\frac{1}{8}$ fc. or $\frac{1}{4}$ c. would be used. It is impossible, however, to lay down hard and fast rules in this respect. Great care must also be taken to ensure that the correct discount rate is used, i.e., the rate ruling in the centre where the bill is *payable*.

In those centres on which no long rates at all are published, rates must be specially calculated by the negotiating banker to cover each different type of bill with which he has to deal, and all such rates may, of course, be properly regarded as *tel quel* rates, whether they are three months' rates or not.

As in the calculation of long rates, it is essential in fixing *tel quel* rates for bills payable *after sight*, to make due allowance for any time lost in transmission to the place of payment, and also for days of grace, if any, since, during any such period, the purchaser will be out of his money. Consequently in applying a *tel quel* rate to a 60 days' sight bill on New York, a London banker would include interest for 8 or 10 days, i.e., the time required for transmission by mail and presentment for acceptance.

Remember also that a two months' bill is better than a three, four, or five months' bill, and that a four months' bill is not as good as a bill due in three months, because the nearer the date on which the money can be obtained, the more valuable the bill is to the holder. In fact, so strong is the preference for a quick turnover, that three months' bills are discountable at easier rates than bills for longer periods; i.e., the latter are *relatively* cheaper to buy and

less remunerative to discount or to sell, for the seller allows the buyer interest at a rate slightly higher than the foreign bank rate.

In brief, the longer the term of the bill, the higher the rate of discount. So in calculating a *tel quel* rate for a bill having a longer term than the usual usance, it is best to work from the short rate than from the long rate, where both are quoted. Assume, for example, that we require the rate for five months' bills and know that the discount rates in the relative foreign centre are as follows:—

1 month	1 %	4 months	2 %
2 months	1½ %	5 ,,	2½ %
3 ,,	1½ %	6 ,,	3 %

Clearly, it is better in such circumstances to add to the cheque rate interest for five months @ 2½ %, i.e., at the rate appropriate to the particular class of paper, rather than to add two months' interest @ 2½ % to the three months' rate. The latter method would not be strictly accurate, for the three months' rate involves interest at 1½ % only, so, by using that rate, the full allowance for interest would not be made in the case of the five months' bills.

Example 30.—*Foreign Rate.*—Find the *tel quel* rate for buying a two months' bank bill on Paris: London on Paris cheque rate 124·20–·25, your profit ⅛ %, other allowances 1 per mille. Market rate in Paris, 8 %.

Solution:—

Short rate (buying)	Fcs. 124·25	
Add two months @ 8 %	1·657	
Allowances, 1 per mille	·124	
Profit, ⅛ %	·155	
Two months *tel quel*	Fcs. 126·186	per £1.

Say, Fcs. 126·19 per £1.

The two months' rate is cheaper, i.e., higher, than the cheque rate, so we *add* allowances.

Example 31.—*Rate in "Home" Currency.*—Find the *tel quel* rate at which a Swiss banker will buy a five months' trade bill on London in Berne, if the bank's rate for three months' bills is Fcs. 25·45–·55 per £1. Bank rate in London 5½ %; market discount 5¼ %.

Solution:—

The bank's buying rate for trade bills is 25·45—the cheaper rate in Switzerland (less of their units per £1). The discount in London for trade bills will be at the Bank rate of 5½ %.

Three months' buying rate on London	..	Fcs. 25·45
Less two months @ 5½ % per annum	..	·233
		Fcs. 25·217

∴ Five months' *tel quel* = Fcs. 25·21½ per £1.

The five months' bill is cheaper than a three months' bill, so that it costs *less* francs in Switzerland. Allowances for stamps, etc., are already included in the three months' rate.

Example 32.—*Foreign Rate.*—A bank in Buenos Aires quotes London 90 days at 47¾–48 pence per peso. Find the rate it will apply to the purchase of a five months' bank bill on England, Bank rate in London 5½ %, market rate being 5½ %.

Solution:—

Three months' buying rate	.. ..	48 pence per peso.
Add two months' (or 60 days) @ 5¼ %		·42
		48·42

Rate applied, say, 48½ pence per gold peso.

The bill is "worse" than a three months' bill, so that the peso purchases more pence.

Example 33.—"*Home Currency.*"—Find the rate quoted by a Paris bank for the purchase of a four months' bill on London if its 3 months' buying rate on London is 125·35. Discount in London 5%.

Solution:—

Three months, Paris on London	..	Fcs. 125·35
Less 1 month @ 5 %	.. ..	·5223
		Fcs. 124·8277

Four months' *tel quel* = Fcs. 124·82¾ per £1.

The longer bill is worth *fewer* francs per £1.

Second Method—Adjust Principal.—Another theoretical method of calculating the value of a bill when there is no long rate applicable is that of adjusting *the principal*; the present worth of the bill in terms

of the currency in which it is drawn is calculated and converted at the short rate. As we have stated, a banker in practice will always adjust his *rate* for the purchase of a bill whose term differs from that usually quoted, but the method of adjusting the principal forms a useful theoretical exercise, as is illustrated in the following examples:—

Example 34.—The Market quotes bank cheques on Paris at 124·20–·25. Market discount in Paris is 6 %, your bank's profit is 15 c. in the rate, allowances on long bills, say, 1 per mille. What would you give for a three months' bill on Paris for Fcs. 12,922, due in one month?

Solution:—

(*a*) ADJUSTING PRINCIPAL:—

Amount of bill	Fcs.	12,922
Less 1 month's interest @ 6 % ..	64·61	
Allowances @ 1 per mille ..	12·92	
		77·53
Present worth		12,844·47

Market buying rate for cheques	Fcs. 124·25
Add profit	·15
Bank's buying rate for cheques	Fcs. 124·40

$$\text{Value of bill for Fcs. } 12{,}922 = £\frac{12{,}844\cdot47}{124\cdot4} = £103\ 5s.\ 0d.$$

(*b*) PRACTICAL METHOD (*Tel Quel* rate):—

Market buying rate for cheques	Fcs. 124·25
Add bank's profit	·15
Interest, 1 month @ 6 %	·62125
Allowances, @ 1 per mille	·12425
Fcs.	125·1455

Tel quel rate, say, Fcs. 125·15.

$$\text{Amount paid for bill} = £\frac{12{,}922}{125\cdot15} = £103\ 5s.\ 0d.$$

Example 35.—If a London bank quotes its rate for the purchase of three months' trade bills on Spain as 35·00 pesetas per £1, how much will it pay for a four months' trade bill on Spain for 3,570 pesetas?

Discount rates: London, 5½ % trade bills, 5¼ % bank bills; Madrid, 8 % trade bills, 7½ % bank bills.

Solution:—

(*a*) ADJUSTING PRINCIPAL:—

Amount of 4 months' bill	3,750	pesetas.
Interest for 1 month at 8 % ..	23·8	
	3,546·2	,,

$$\text{Amount paid by bank} = £\frac{3{,}546 \cdot 2}{35} = \underline{£101\ 6s.\ 5d.}$$

(*b*) PRACTICAL METHOD (*Tel Quel* rate):—

Buying rate for 3 months' bills ..	Ptas. 35·00
Add interest for 1 month @ 8 % ..	·233
	Ptas. 35·233

Tel quel rate, say, Ptas. $35\frac{1}{4}$.

$$\text{Amount paid by bank} = £\frac{3{,}570}{35 \cdot 25} = \underline{£101\ 5s.\ 6d.}$$

Example 36.—A banker in Monte Video is offered a 120 days' bill for £1,000 on London. What rate should he apply if his buying rate for 90 days' drafts is 50¼d. discount in London 7 %, and in Monte Video 7¼ %?

Solution:—

Buying rate for 90-days' drafts on London ..	50·25	pence
Add interest @ 7 % for 30 days	·289	
	50·539	,,

Tel quel rate = $50\frac{9}{16}$ pence.

"Tel Quel" Rates for Broken Periods.—In the foregoing examples, the interest has been calculated for periods of one or two months, but most bills differ from the quoted periods by a given number of days, and, in such cases, the interest should be calculated by the "third, tenth and tenth rule" given in a previous chapter.

Example 37.—Find how much a London banker will give for a bill on Italy for lire 21,458, due on the 30th of November, purchased in London on the 8th of August. Banker's buying rate for three months' bills is 93·70, and discount in Rome is 5 %.

Solution:—

Banker's buying rate for 3 months' bills (due on 8th November)	93·70	lire
Add interest for 22 days (November 8th–30th) ..	·2824	,,
	93·9824	,,

Tel quel rate, say, lire 93·99.

$$\text{Amount paid by banker} = £\frac{21{,}458}{93\cdot99} = £228\ 6s.\ 0d.$$

Example 38.—On the 5th April you are offered for discount a bill drawn on and accepted by the Crédit Lyonnais, Paris, for Fcs. 100,000. The bill is at 90 days' sight and was accepted on 1st March. It is already French stamped, but does not bear an English stamp. The French rate of discount is 2 % per annum on the basis of a 360-day year; there is a French Government tax of 2 % flat on the discount; the last 8 days' discount is, by French custom, worked at the French Bank rate, which is 3 %; and you are a dealer in Paris cheque at 83·90–84·00. Find the sterling amount for which your cheque should be made out. Mailing period 2 days.

Solution:—

The bill is due on 30th May. It has therefore 55 days to run, i.e., 25 days in April and 30 in May. Since a cheque could be collected in 2 days (mailing period), interest must be allowed for 53 days.

Buying rate for cheques			Fcs. 84·00
Add interest for 45 days at 2 % ..	·21		
,, ,, 8 days at 3 % ..	·056		
	·266		
Plus tax @ 2 % on ·266	·0053		
			·2713
			Fcs. 84·2713

Tel quel rate, say, Fcs. 84·27¼.

$$\text{Amount paid for bill @ } 84\cdot27\tfrac{1}{4} = £\frac{100{,}000}{84\cdot2725}$$

	= £1,186	12	6
Deduct stamp ..	0	6	0
Proceeds ..	£1,186	6	6

NOTE.—The bill stamp is calculated at ¼ per mille. The bill bears no English stamp, so that it must have been drawn abroad.

Example 39.—On 30th September a customer presents to you for

negotiation a bill for $15,000 on New York payable on 14th December. On the day of negotiation you are prepared to deal in T.T. New York at 4·45½–·46. The rate of discount in New York is 4¾ % per annum, and is calculated on a 360-day year.

Calculate (*a*) Your buying rate for the bill, to the nearest ¼ c.; (*b*) The amount with which you will credit your customer.

There is no stamp duty on bills in U.S.A., but you will be charged a collecting commission of ⅛ %.

Solution:—

(*a*) The bill is due on 14th December. Hence it has 75 days to run (31 in October, 30 in November, 14 in December).

Banker's buying rate for T.T.		4·46
Add interest, 75 days at 4¾ %		·0441
Collecting charge, ⅛ %		·0056
		4·5097

Banker's buying rate (to nearest ¼ c.) = $4·51 per £1.

(*b*) Value of bills totalling $15,000 at $4·51 per £1

$$= £\frac{15{,}000}{4·51}$$
$$= £3{,}325·942$$
$$= £3{,}325\ 18s.\ 10d.$$

Example 40.—On the 21st November a customer presents to you for discount a bill for Fcs. 75,000 payable in Paris, due on the 10th January. If the three months' rate on Paris is quoted in the London Market as 125¼–½, at what rate would you discount the bill, allowing 1/16 % as your profit, and with how much sterling would you credit the customer's account for the proceeds? Paris discount rate is 3½ %. There are no days of grace in Paris.

Solution:—

Market buying rate for 3 months' bills ..	Fcs. 125·50
Add bank's profit, 1/16 %	·079
Bank's buying rate for bills due 21st February	Fcs. 125·579
But the bill in question is due on 10th January	
Hence an allowance must be made for 42 days (10th January–21st February).	
∴ *Deduct* interest for 42 days @ 3½ % ..	·505
	Fcs. 125·074

Rate to be applied (to nearest working rate) = Fcs. 125·08.

$$\therefore \text{ Credit customer with } £\frac{75{,}000}{125\cdot08} = \text{£599 12s. 4d.}$$

Mixed Parcels.—Parcels of foreign bills usually include bills whose periods differ from the quoted usance, and also from one another. In such cases it is necessary to make an allowance for interest on each bill, but if the customer is agreeable to having the bills "lumped together", it is possible to work out the proceeds in one calculation as in the following example:—

Example 41.—Find the amount for which a London banker will buy the following bills on Berlin, on the 8th of August, the bills being due on the dates shown. Discount in Berlin 4 % per annum; buying rate for three months' bills 20·13.

Solution.—

	Bill.	Date due.	(*a*).	(*b*).
Mks.	5,000	21st Oct.	18	90,000
,,	2,500	30th ,,	9	22,500
,,	7,520	2nd Nov.	6	45,120
,,	10,250	5th ,,	3	30,750
,,	25,270			188,370

$$\text{,, } 20\cdot64 = \text{Interest} = \frac{188370}{365} \times \frac{4}{100} = \frac{1506960}{73000}.$$

Mks. 25,290·64

By third, tenth and tenth rule:—

= 15·070
5·023
·502
·050
20·645
·002
20·643

$$\text{Proceeds} = \frac{25290\cdot64}{20\cdot13} = £1{,}256\cdot366$$

= £1,256 7s. 4d.

METHOD.—In column (*a*) insert days short (or over) the quoted period (i.e., the difference in days between the maturity of the bills

and 8th November). In column (*b*) insert the product of the number of days × amount of bill. Add, and find the interest as shown. As all the bills are due in *less* time than a three months' bill they are worth more, so the interest is *added* to the principal, i.e., the total amount of all the bills. (See Chapter XXIV.)

Flat Rates of Negotiation.—Bills drawn *in sterling* on places abroad (especially South America) and bearing an exchange clause such as "Payable by approved banker's 90 d/s draft on London", are often negotiated at a "flat" percentage rate deducted from the face amount of the bill. The banker, in effect, treats the negotiation of the bill as an advance of sterling for the period from the date of negotiation until the return remittance becomes discountable, and from then as an ordinary sterling discount (see p. 139).

Example 42.—Calculate (*a*) the "flat" rate of negotiation to be applied to, and (*b*) the net amount which would be realised by, a bill for £7,823 6s. 8d. drawn from Hamburg on Rio de Janeiro at 90 d/s and claused "Payable by approved banker's draft on London at 90 d/s". The period of the mail between London and Rio is 21 days; the London banker's rate for sterling advances is 5 % per annum; the London discount rate for three months' bank bills is $1\frac{7}{16}$ % per annum; Brazilian stamp duty 3 per mille; and agents' collecting charges $\frac{1}{4}$ %.

Solution:—

(*a*) "FLAT" RATE OF NEGOTIATION.

Cost of sterling advance for 132 days (90 + 42 days *) at 5 % per annum	1·8082 % flat.
Discount of return remittance—93 days at $1\frac{7}{16}$ % per annum	·3663 % ,,
Brazilian bill stamps at 3 per mille	·3 % ,,
Agent's charges at $\frac{1}{4}$ % *ad val.*	·25 % ,,
	2·7245 % ,,

∴ The bill would be negotiated at a flat rate of, say, $2\frac{3}{4}$ % *ad. val.*

* Note that the advance is made for the period which elapses between the transaction and the receipt of the "return remittance" in London, i.e.,

For the outward mailing period	21 days
For the period of the bill	90 ,,
For the homeward mailing period	21 ,,
	132 ,,

(*b*) PROCEEDS OF BILL.

	£	s.	d.	£	s.	d.
Face amount				7,823	6	8
Less—Negotiation charge of $2\frac{3}{4}$ % ..	215	2	10			
English bill stamp ($\frac{1}{4}$ per mille)	1	19	6			
English bill stamp on return remittance ($\frac{1}{2}$ per mille) ..	3	19	0			
				221	1	4
				£7,602	5	4

∴ Net proceeds of bill: £7,602 5s. 4d.

NOTE.—(1) It is important to note that the rate of negotiation applied is a "flat" *ad valorem* percentage, and not a percentage *per annum*.

(2) The charge for English stamps is deducted from the proceeds and not included in the flat rate.

Example 43.—You are asked to negotiate at a flat rate a four months' date bill on Bombay. It has just been drawn by a Manchester firm, on impressed stamp paper, for £2,904 10s. 7d., and it is expressed to be payable by a banker's three months' sight draft on London.

Working on an overdraft rate of $4\frac{1}{2}$ %, mail time 21 days, and return remittance discountable at $2\frac{1}{2}$ %, you can take the Indian stamp duty, collecting commission and charges at an inclusive figure of $\frac{1}{2}$ %.

(*a*) Ascertain the rate you would apply to this bill to the nearest $\frac{1}{16}$ %.

(*b*) The amount you would credit your customer.

(*c*) Explain how you would have dealt with the bill if it were drawn payable by T.T. on London together with interest and collecting charges, as usually incorporated in an Eastern interest bill.

Solution:—

(*a*) *Flat Rate* for 4 months' date bill on Bombay:—

Interest, 4 months at $4\frac{1}{2}$ %	1·5	%
,, 21 days at $4\frac{1}{2}$ %	·2589	%
3 months' discount at $2\frac{1}{2}$ %	·625	%
Commission, etc., at $\frac{1}{2}$ %	·5	%
	2·8839	%

Rate applied, $2\frac{15}{16}$ % (to nearest sixteenth).

	£ s. d.	£ s. d.
(*b*) Amount of bill		2,904 10 7
Less deduction of $2\frac{15}{16}$ % ..	85 6 5	
Stamps on return remittance ($\frac{1}{2}$ per mille)	1 10 0	
		86 16 5
		£2,817 14 2

Amount to be credited = £2,817 14s. 2d.

(*c*) If the bill had been enfaced with an interest clause "Payable at the ..... Bank's selling rate for T.T. on London, together with interest at ..... % per annum from date hereof until approximate date of arrival of remittance in London plus all collection charges", the customer could be credited with the fall face value, as the collecting banker can recoup himself from the drawee.

Advance for Mailing Period.—Conditions sometimes justify a foreign banker in treating the purchase of a sterling bill as being an advance of the home currency during the period which must elapse before the bill is discounted, just as in the above examples the English banker treats the first part of the transactions as an advance of sterling. The following example will illustrate this point.

Example 44.—An Indian banker is asked to buy a 4 months' sight bill on London. If the discount rate in London is 3 % and the mailing period is 1 month, calculate the rate he will quote, allowing for stamp duty in London and for the banker's profit of 1 per mille on a T.T. rate of 1s. $6\frac{1}{8}$d. Overdraft interest at the rate of 6 % is to be allowed for on the period of the voyage.

Solution:—

Banker's buying rate for T.T.			18·125
Add Profit, 1 ‰	·018125		
Stamp duty, $\frac{1}{2}$ ‰	·0090625		
Interest at 6 % for 1 month ..	·090625		
Discount at 3 % for 4 months	·18125		
	·2990625	·299	
			18·424 pence

Say, $18\frac{7}{16}$ pence per rupee.

Dishonoured Bills.—When a bill is purchased from a customer and is subsequently dishonoured, the banker has a right of recourse against

the customer for the amount of the bill together with any necessary expenses incurred through the dishonour. The banker can debit the customer with this amount in currency, and where the customer has a currency account he may be willing to settle the matter in this way. More usually, the transaction is cleared by the customer's *buying* from his bank the necessary amount of currency, which the banker, in effect, pays over to himself, and by the banker's debiting the customer with the sterling cost of the currency.

Example 45.—You negotiate for a customer a 90 d/s draft on a secondary town in Hungary for 30,000 pengöes. On the day when the bill is presented to you, you are willing to deal in cheque Budapest at 27·75–·80. The foreign stamp duty is $\frac{1}{2}$ per mille, and there is a "*perte de place*" or collecting charge of $1\frac{1}{2}$ per mille. The rate of discount applicable is 12 % per annum. Calculate the rate for negotiation to the nearest filler and the amount with which you will credit your customer.

At maturity the bill is dishonoured and protested. On the day of its return the market rates for T.T. Budapest are 29·50–·55. The protest and other expenses of dishonour amount to 125 pengöes. What amount in sterling will you require from your customer to clear the bill, allowing yourself a turn of 5 fillers in the rate?

Solution:—

Buying rate for cheques	27·80
Add interest, 90 days at 12 %	·822
Charges 2 per mille	·056
	28·678
∴ Buying rate for 90 d/s draft	28·68

Value of 90 d/s draft for 30,000 pengöes

$$= £\frac{30{,}000}{28\cdot68}$$

$$= £1{,}046\cdot025$$

Amount credited to customer = £1,046 0s. 6d.

Marked selling rate at maturity = 29·50

∴ *Banker's* selling rate at maturity = 29·45

Amount required from customer $= £\frac{30{,}125}{29\cdot45}$

$= £1{,}022\cdot920$

$= £1{,}022\ 18s.\ 5d.$

Example 46.—You discount for a customer a bill for £1,000, drawn from London on a secondary town in Holland. It is at 90 d/s, and bears the clause: "Exchange as per endorsement." The foreign stamp duty is ½ per mille, and there is a "*perte de place*", or collecting charge, of 1½ per mille. On the day of negotiation you are ready to deal in cheque Amsterdam at 12·09–·09¼. The rate of discount applicable is 4½ % per annum.

(*a*) Work out the amount in florins for which you will make the bill payable.

(*b*) At maturity the bill is dishonoured and protested. On the day of its return you are prepared to deal in T.T. Amsterdam at 12·07½–·07¾. The protest and other charges of dishonour amount to Fls. 57. What amount in sterling will you require from your customer to clear the bill?

Solution:—

(*a*) Buying rate for cheques .. .. .. Fl. 12·0925
Add stamp duty and collecting charges
2 per mille .. .. ·0242
Interest, 90 days at 4½ % .. .. ·1342
Fl. 12·2509

∴ Banker's buying rate for 90 d/s draft = Fls. 12·2509 per £1, say, 12·25¼.

Bill will be made payable for Fls. 12,252·50.

(*b*) Amount of bill .. .. Fls. 12,252·50
Add protest and other charges .. .. 57·00
Fls. 12,309·50

∴ Amount required from customer = $£\frac{12{,}309 \cdot 5}{12 \cdot 075}$

= £1,019 8s. 5d.

Reverse Stock Drafts.—The method of calculating the rate to be applied to a reverse stock draft has already been explained (p. 125). The following provides another example.

Example 47.—A London banker is asked by a stockbroker to arrange for the payment in New York of a cheque on London for $1,319·65. The draft will have attached to it a parcel of bonds. Allowing eight days for mailing, ¼ % for insurance and 3 % interest

in London, how much will the banker charge the stockbroker, if he is a dealer in T.T. at $\$5 \cdot 04\frac{1}{4} - \cdot 04\frac{3}{8}$?

Solution:—

Selling rate for T.T.		\$5·0425
Deduct Interest for 8 days at 3 % ..	= ·0033	
Insurance, $\frac{1}{4}$ %	= ·0126	
		·0159
		\$5·0266

Rate applied, say, $\$5 \cdot 02\frac{11}{16}$

$\therefore$ Sterling amount for which stockbroker will be liable $= £\frac{1{,}319 \cdot 65}{5 \cdot 026875}$

$= £262 \ 10s. \ 5d.$

CHAPTER XXVIII

EXCHANGE DEALING

THE arithmetical operations arising from ordinary exchange dealing, i.e., buying and selling foreign currency, are of the simplest possible nature, since they merely involve conversions from one currency to another. In practice, the majority of such conversions are effected with great rapidity by calculating machines, and the only points of difficulty arise in the application to the particular transaction concerned of the correct rates, buying or selling as the case may be, and in adequately and correctly allowing for all expenses which may be involved.

It is obviously of the first importance that, in calculating the rates of exchange at which he is prepared to operate, or at which he proposes to operate, the dealer should accurately take into account all charges which he has to incur, such as brokerage, postages, telephone calls, telegrams, cables and foreign agents' commission, together with interest, if any, lost or gained on the funds involved.

Interest must be allowed at the correct rate for each day that the bank is out of its funds, or for each day that it has the use of funds. Commission or profit must be reckoned, where necessary, for the bank's agent in another centre who is required to execute a purchase or a sale for account of the operating banker. Even though such commission or profit may not be chargeable by the agent as a separate item on a given transaction, it must not be overlooked that there may be a reciprocal arrangement for charging, say, $\frac{1}{16}$ or $\frac{1}{8}$ per mille on the turnover of the operating bank's foreign currency account, and such a charge must, of course, be allowed for by a dealer who is working on a fine margin of profit. Brokerage must also be taken into account in any deals with the Market, but it does not of course arise in connection with deals with customers.

Special care is required in connection with brokerages, since these are usually of very small amount "in the rate", but may be considerable on a deal of any importance. The following table gives the

list of brokerages payable in London at the time of writing on the most important currencies, but it must be understood that the rates are in no sense fixed.

LIST OF LONDON EXCHANGE BROKERAGES PAYABLE BY BOTH SIDES WITH A MINIMUM OF 2s. 6d. EACH SIDE.

Currency				
U.S.A.	£1	10	0	per 100,000
Canada	£2	0	0	per 100,000
France		2	0	per 100,000
Belgium		10	0	per 100,000
Germany	£1	10	0	per 100,000
Italy		4	0	per 100,000
Holland	£1	5	0	per 100,000
Spain		12	6	per 100,000
Norway		12	6	per 100,000
Denmark		12	6	per 100,000
Sweden		12	6	per 100,000
Switzerland		12	6	per 100,000
Greece		10	0	per 100,000
Egypt		3	4	per £E 1,000
Belgrade		10	0	per 100,000
Bucharest		5	0	per 100,000
Budapest			$\frac{1}{8}$	pengö
Constantinople	1 ‰ of Sterling Equivalent			
Dantzig	£1	0	0	per 100,000
Helsingfors		10	0	per 100,000
Kovno	£1	0	0	per 100,000
Lisbon		12	6	per 100,000
Prague		10	0	per 100,000
Reval	£1	0	0	per 100,000
Riga	£1	0	0	per 100,000
Sofia		10	0	per 100,000
Warsaw	£1	0	0	per 100,000

Ordinary Buying and Selling.—As an example of the manner in which a dealer makes profits from ordinary dealing in exchange, we may suppose that an operator buys, say, $100,000 at $4\cdot84\frac{3}{4}$, and sells $100,000 at $4\cdot84\frac{5}{8}$. The sterling equivalents are £20,629 3s. 10d. and £20,634 10s. 2d., and the gross profit is, therefore, £5 6s. 4d. How much of this is net profit depends on the circumstances of the case. If the dollars are bought from one customer to the debit of his dollar account and are sold to another customer to be credited to a dollar account, the bank has practically no expenses except for cables, and makes about £5 profit. If, however, both deals are done on the London Market, the bank has to pay two brokerages of 30s. 0d. each and two cables (a " pay " and a " receive ") costing about 5s. each, thus reducing the net profit to £1 16s. 4d.

Although brokerages, as indicated by the foregoing table, are usually quoted as so many shillings and/or pence for a quantity of foreign currency concerned, dealers who have to take brokerage into account when transacting business for customers or with the Market facilitate their operations by reckoning the brokerages as so much "in the rate". In other words, a dealer who receives a given quotation from the Market will mentally figure out the "all-in" price of the currency concerned by allowing for the brokerage which will have to be paid. When rates of exchange are stable, the equivalents of the brokerages in the various rates are naturally subject to little alteration, but when rates are frequently fluctuating, as they are at the time of writing, the equivalents must be calculated by the dealer as often as the rates move sufficiently to affect the equivalent.

Example 1.—The present rate of brokerage on French francs is £1 per million to each dealer, and on dollars £1 10s. per $100,000. If francs are 80 to the £1 and dollars are 4·50, ascertain:—

(*a*) The proportion of brokerage per mille (i.e., per £1,000).
(*b*) What the brokerage amounts to "in the rate".
(*c*) Buy $100,000 at 4·50¼ and sell them at 4·50.
Deduct two brokerages as above, and ascertain net profit.

Solution:—

(*a*) Fcs. 1,000,000 @ 80 = £12,500.
A brokerage of £1 on £12,500 is equivalent to

$$\frac{1}{12{,}500} \times \frac{1{,}000}{1} \text{ per mille} = \underline{\cdot 08 \text{ per mille.}}$$

$$\$100{,}000 \text{ @ } 4\cdot 50 = £\frac{100{,}000}{4\cdot 50} = £22{,}222 \text{ approx.}$$

A brokerage of £1 10s. on £22,222 is equal to

$$\frac{1\cdot 5}{22{,}222} \times \frac{1{,}000}{1} \text{ per mille} = \underline{\cdot 0675 \text{ per mille.}}$$

(*b*) ·08 per mille on 80 francs = Fcs. $\frac{\cdot 08 \times 80}{1{,}000} = \frac{6\cdot 4}{1{,}000}$

∴ Brokerage on francs = $\underline{\text{Fcs. } \cdot 0064 \text{ in the rate.}}$

·0675 per mille on 4·50 = $\frac{\cdot 0675 \times 4\cdot 50}{1{,}000} = \frac{\cdot 30375}{1{,}000}$

∴ Brokerage on dollars = $\underline{\$\cdot 0003 \text{ in the rate.}}$

		£	s.	d.
(*c*) $100,000 sold @ 4·50 realise	£$\frac{100{,}000}{4\cdot 50}$ =	22,222	4	5
$100,000 bought @ 4·50¼ cost	£$\frac{100{,}000}{4\cdot 5025}$ =	22,209	17	8
Gross Profit =		£12	6	9
Deduct 2 Brokerages @ £1 10s. =		3	0	0
Net Profit =		£9	6	9

Example 2.—What allowances should a London banker make in his rates on Paris and New York respectively, to cover: (1) a commission of ½ per mille; (2) brokerages of 2s. per Fcs. 100,000 and £1 10s. per $100,000 respectively? Assume basic rates of Fcs. 80·25¼ and $4·75$\frac{1}{16}$. State whether the allowances should be added to or deducted from his rates (*a*) for buying, (*b*) for selling, and give two examples of such adjustments.

Solution:—

(1) ½ per mille on Fcs. 80·25 $= \frac{1}{2{,}000} \times \frac{80 \cdot 25}{1}$
$=$ Fcs. ·04 approx. (or 4 centimes).

½ per mille on $4·75 $= \frac{1}{2{,}000} \times \frac{4 \cdot 75}{1}$
$=$ $·002375 (or ¼ cent).

(2) 2s. per Fcs. 100,000, when francs are 80·25 = £1
is equivalent to Fcs. 8 per 100,000
or ·08 per mille.

·08 per mille on Fcs. 80·25 $= \frac{\cdot 08}{1{,}000} \times \frac{80 \cdot 25}{1}$
$=$ Fcs. ·0064 (say ¾ centime).

30s. per $100,000, when dollars are 4·75 = £1
is equivalent to $\$\frac{4 \cdot 75 \times 3}{2}$ per 100,000
or $\frac{4 \cdot 75 \times 3}{200}$ per mille
$=$ ·07125 per mille.

·7125 per mille on $4·75 $= \frac{\cdot 07125}{1{,}000} \times \frac{4 \cdot 75}{1}$
$=$ $·00034 (say $\frac{1}{3}\frac{1}{2}$ cent).

For *buying*, these allowances should be *added* (Buy High).
For *selling*, they should be *deducted* (Sell Low).

Thus, given basic rates of Fcs. 80·25¼ and $4·75$\frac{1}{16}$, the following adjustments are needed:—

FRANCS.
Buying rate would be Fcs. 80·25¼ *plus* 4 c. + ¾ c., say, Fcs. 80·30.
Selling rate would be Fcs. 80·25¼ *less* 4¾ c., say, Fcs. 80·20½.

DOLLARS.
Buying rate would be $4·75$\frac{1}{16}$ *plus* ¼ c. + $\frac{1}{3}\frac{1}{2}$ c., say, $4·75$\frac{1}{3}\frac{1}{2}$.
Selling rate would be $4·75$\frac{1}{16}$ *less* $\frac{3}{3}\frac{1}{2}$ c., say, $4·75$\frac{2}{3}\frac{5}{2}$.

Example 3.—Given that the expenses incurred by a banker on a deal of Fls. 20,000 amount to £2, calculate what margin he should allow for these expenses on a rate of Fls. 8·05 per £1.

Solution :—

£2 converted at Fls. 8·05 = Fls. 16·10

Fls. 16·10 on Fls. 20,000 = $\frac{16 \cdot 10}{20{,}000} \times \frac{1{,}000}{1}$ per mille

= ·805 per mille.

·805 per mille on Fls. 8·05 = $\frac{8 \cdot 05 \times \cdot 805}{1{,}000}$

= Fls. ·0065

Say, ¾ cent.

NOTE how the charge is expressed first as a per milleage. This step is not essential, of course, but it is desirable to include it, as a per milleage can often be more easily handled than a mere fraction.

Exchange Operations with Foreign Centres.—Apart from the deals effected with customers and those transacted on the London Market, a London dealer carries out a considerable number of deals on foreign markets. These he effects through the intermediary of his agents abroad, to whom his instructions are sent usually by telephone, telegram or cable. On his part, the dealer carries out deals on the London Market on behalf of his correspondents, and in some cases he operates on joint account with such agents.

When the business is transacted by telephone, the parties concerned (who are in constant touch with their respective markets) compare rates and arrange the bargains during the period of the call, the transactions being subsequently confirmed in writing.

If telegrams or cables are used, the time taken to execute the business will depend on the distance between the centres and on the expedition with which the message is dealt with by the Post Office or the cable company concerned. Apart from the fact that all such messages must be properly authenticated, the operating banker must, of course, give his correspondent precise instructions as to whether or not he is to use his discretion in executing the order; i.e., whether the agent is to buy or sell at the best rate obtainable ("*at best*"), or at a *limited rate*. And in either case the operating banker may impose a *time* limit within which he requires the transaction to be executed, for he cannot, of course, keep business indefinitely open on this side while his correspondent searches his own market for a buyer or seller.

With the object of saving expense on telegrams and cables, messages involving orders to buy or to sell are expressed in abbreviated form wherever possible, certain symbols and contractions being employed which are made up by the dealers concerned in such a manner as to be intelligible to the recipients.

The made-up words, though usually only abbreviations of plain

English, are accepted as code for transmission by the cable companies provided they do not contain more than a specified number of letters or figures, but the limits have been varied from time to time. At the time of writing the limit per word is *five* letters or figures, but the following examples, which were compiled when the limit was *ten* letters or figures, are retained because no change of principle is involved.

Message : BUYMILAN HAFMILION BEST
Interpretation : Buy 500,000 lire at the best rate obtainable on our account.

Message : SOLDOLS HALFMIL 48626
Interpretation : We have sold $500,000 at $4\cdot86\frac{17}{64}$ on your account.
(NOTE.—The rate is always understood to be in decimals, which, in the case of the New York rate, are given to the fourth place. Thus $5\cdot01\frac{1}{8}$ is 5·01125, but is given as 50112; $5\cdot01\frac{7}{16}$ is 5·014375, but is given as 50143, and so on.)

Message : LIMIT 2680 SELDOLS TWOHUNTHO
(Sent to Stockholm)
Interpretation : Sell $200,000 at a rate not higher than $26·80 per 100 kronor.

Message : LIMIT 2680 BUYOSLO HUNTHOJNT REPLYHERE FIVLATEST
(Sent to New York)
Interpretation: On our joint account buy 100,000 Norwegian kroner at not more than 26·80 cents per krone and subject to your advice being received here not later than 5 o'clock to-day.

Message: BESTPOSSEL HUNFIFTHO DOLLARS FRI
Interpretation: At best possible rate sell $150,000, value Friday.

Message: SLPDSTWNTY THOFRIAGST ENDAUGUST
Interpretation: Sell at best possible rate £20,000 value Friday against a purchase of the same amount for delivery at the end of August.

Message : OFRYOUDEM SVNTYFVTHO 48487 DOUAGREE
Interpretation : We offer you a demand draft on London for £75,000 at $4\cdot84\frac{7}{8}$. Do you agree?

Message: SLRSTWOHUN THOMONTRL NOVFIFTEEN ORYOUROPTN NOVEMBER 48581
Interpretation : We are sellers of 200,000 Canadian dollars (i.e., Montreal) value 15th November or delivery at your option during November, at $4\cdot85\frac{13}{15}$.

Message : BUYJOINT OSLOCOP HUNTHEACH REPLYHERE FOUR-LATEST
Interpretation : On our joint account buy 100,000 Norwegian kroner and 100,000 Danish kroner, subject to your advice being received here not later than four o'clock to-day.

Message : REMIT ZURICH TWOHUNTHO BEST
(To Milan)
Interpretation : Buy 200,000 Swiss francs on our account at the best rate obtainable against your own currency, i.e., lire.

Message : HOWYUGIVE TWOHUNTHO PARIS SPOTAGST ENDAUGUST
Interpretation : At what rate will you sell 200,000 French francs spot against a similar amount deliverable at the end of August; i.e., at what rate will you "swap" 200,000 Fcs. spot against 200,000 Fcs. forward, end August.

Message : SWAPPARIS FIFTYCENTS YURFAVOUR
Interpretation: We will swap the French francs at 50 cents in your favour.

Message : SELLPARIS FIVHUNTHO FRIDAGST THREEMOS FIFTCENTS OURFAVOUR
(From Paris)
Interpretation : Sell 500,000 French francs on our account for delivery Friday against purchase of three months forward francs at a difference of 50 c. in our favour.

If the London spot rate is, say, 124·20–·30, the rates applicable to the swap will be 124·30 and 124·80, i.e., the forward, to be sold at 50 centimes in favour of the French buyer, must be higher than the spot.

Message : BYPARISPOT TWOHUNFIF THOGSTDOLS LIMIT 393
(From New York)
Interpretation: Buy 250,000 T.T. Paris against dollars on our account at a rate not worse than 393 cents per 100 francs.

As is indicated above, it is the practice to employ five figures such as 48631 as a code meaning $4 \cdot 86\frac{5}{16}$ (4·863125 abbreviated), but this should not be done unless the abbreviation is understood by the dealer on the other side. Cases have occurred where the symbol has been taken *literally*. Thus

HUNTH PDS 48631

has been interpreted as £100,000 at 4·8631 and $486,310 have been paid instead of $486,312·50 as expected. For this reason any dealer who proposes to use this form of abbreviation should do so only if his agent abroad clearly understands that the dealer will always deal in fractions of a cent.

Orders to Buy and Sell at Best.—If the cabled or telegraphed message containing an order, despatched to or received from a correspondent, contains no reference to a rate, it is understood to mean that the operation is to be transacted at the best rate obtainable. Thus a telegram to a London dealer from his agent in Stockholm instructing the dealer to buy $500,000 at best might be worded:—

"*Bydls hafml best.*
Swebk."

In such a case, the reply and advice to the Swedish bank might read:—

"*Btdls hafml* 48631.
Lombk."

By this message the Swedish banker understands that his London correspondent has bought $500,000 at $4·86\frac{5}{16}$ per £1 on his account,

and he will, if necessary, take steps to cover the transaction by selling the requisite amount of dollars and purchasing the sterling required to meet the debt against him in London.

Example 4.—A London dealer has bought Kr. 150,000 (Stockholm) from a Continental seller at 18·15, being under the impression that they could be sold at a better price. Unfortunately the Market here turns against him, so he decides to sell the kronor in New York and accordingly wires his agent there at close of business in London:—

"SELL BEST 150,000 STOCKHOLM AGAINST DOLLARS"

In anticipation of the execution of this order he sells a round amount of dollars ($45,000) against the expected proceeds of the kronor, at the market rate of $5 \cdot 35\frac{1}{2}$.

The dealer in New York wires execution at $29·75 per Kr. 100.

(*a*) At what equivalent rate (1 kronor per £1) has the dealer really sold the kronor?

(*b*) What will be his profit or loss, ignoring expenses?

Solution:—

(*a*) ? How many kronor = £1
if £1 = $5 \cdot 35\frac{1}{2}$
and $29·75 = 100 kronor

$$= \frac{535 \cdot 5}{29 \cdot 75} = \text{Kr. 18 per £1.}$$

	£	s.	d.
(*b*) The dealer buys Kr. 150,000 @ 18·15	= 8,264	9	3
In New York, Kr. 150,000 sold @ $29·75 per 100 realise $1,500 × 29·75 = $44,625, which have been covered @ $5 \cdot 35\frac{1}{2}$ and so realise £$\frac{44,625}{5 \cdot 355}$	= 8,333	6	8
Profit	£68	17	5

Example 5.—A Stockholm banker has sold $100,000 to a customer at Kr. 3·733 per dollar and wishes to cover through London. He telegraphs a London dealer to buy the dollars at best (e.g., "*Bydls hunth best*") and is informed by wire that they have been obtained at $4 \cdot 86\frac{1}{4}$ (e.g., "*Btdls hunth* 48625"). If the Stockholm banker can purchase the sterling necessary to cover his purchase of dollars at 18·15, what is his profit or loss on the transaction in terms of kronor? Ignore expenses and charges.

Solution:—

Proceeds of sale to customer = 100,000 × 3·733 = Kr. 3,733,000

Sterling cost of $100,000 @ $4 \cdot 86\frac{1}{4}$ = £$\frac{100,000}{4 \cdot 8625}$

Kr. cost of covering sterling = $\frac{100,000 \times 18 \cdot 15}{4 \cdot 8625}$ = Kr. 3,732,648

Profit Kr. 352

Limit Orders.—If the foregoing order to the London dealer was to be executed at a limit, the message might read:—

"*Limit* 48625 *bydls hunth.*
Swebk."

The figure of 4·86¼ would have been arrived at by the Stockholm banker after consideration of the rates at which sterling and dollars were respectively quoted in Stockholm, for he would not, of course, instruct the London dealer to buy dollars against sterling up to the limit specified if he were able to get them any cheaper in Stockholm or, for that matter, in any other centre.

Occasionally the correspondent may be given limits in respect of two or more currencies, and he may be instructed to buy or to sell that currency whose current price is the nearest to the given limit. Or the agent may be asked to sell one currency and to buy another, for the account of the operating dealer, at or better than certain limits.

In such cases it rarely happens that the prevailing market rates agree with the limits fixed by the dealer forwarding the message, and the agent must therefore determine first of all whether the order is to be executed or not.

Viewing the matter from the point of view of London, we see that, for a simple order to buy or to sell a given currency, all the dealer has to do is to determine whether present rates are better or worse than the limits quoted. For this purpose it is necessary to bear in mind the maxim previously referred to for *currency* rates:—

"Buy high, sell low,"

the reverse being true for *pence* rates. That is to say, if he is buying he must watch for a present rate in foreign money which is equal to or *higher* than the limit quoted, and he would not execute the order if the rate had dropped below the limit fixed by his correspondent. On the other hand, he would watch for an equivalent rate or a *lower* rate in foreign money if he had to sell foreign currency, and he would not execute a sale order if the rate concerned had risen above the limited price.

In accepting such "limit orders" from the *customers*, it is the practice of bankers to disclaim all responsibility for their execution. Customers frequently leave limit orders good for, say, three months at a rate well removed from the current rate; and it is quite possible that the rate may momentarily touch the stipulated figure without there being any possibility of executing the order. For example,

if an order is given to sell dollars at 4·90 at a time when the current rate is about 4·95, it is possible that at some time the rate may drop to the figure stipulated, and an odd deal or so be done at that figure; yet within the next five minutes the rate may rally two cents or so. It is, therefore, the practice to stipulate when acknowledging limit orders received from customers that " while this order will receive our careful attention, it is accepted only on the understanding that we incur no liability for its execution, even though the rate reach the stipulated limit ".

This precaution is not, however, usually necessary in respect of orders received from banks, as such orders are rarely good for longer than half an hour or so, or, perhaps, overnight.

Optional Orders.—A currency which is under strict Governmental control may only be saleable or purchaseable with difficulty. In such a case, in order to give the correspondent in the centre concerned a reasonable chance to fulfil an order, alternative methods are offered. Suppose, for example, that a London dealer requires blocked pengöes and that he instructs his agent in Budapest to buy some for his account. Now, if the order is sent " Buy P. 100,000 at best ", the restricted nature of the local exchange market may make it difficult for the Budapest agent to secure the currency at anything like a reasonable price. In such a case, the London bank will wire " Buy P. 100,000 against pounds, dollars or any gold currency whichever is best ", thus giving the local dealer a chance to fix up a deal in his own town on the easiest and best terms.

Example 6.—A London bank cables its Hungarian correspondent:—

" Buy 100,000 Budapest against sterling or "
" Zurich whichever best ",

and receives a wire—

" Bought for your account Pengöes 100,000 pay "
" Credit Suisse Zurich our account Swiss "
" Francs 42,400 ".

At what rate does the London bank obtain the pengöes, if the London Market rate for Swiss francs is $15 \cdot 90 - \frac{3}{4}$?

Solution :—

The cost of Sw. Fcs. 42,400 bought in London is

$$£\frac{42,400}{15 \cdot 90} = £2,666 \ 13s. \ 4d.$$

In exchange for this, the London bank is credited with Peng. 100,000.

$\therefore$ The rate at which he gets the pengöes is

$$\frac{100,000}{2,666 \cdot 6} = \underline{\text{Peng. } 37 \cdot 50 \text{ per } £1.}$$

An alternative method is for the London dealer to quote actual figures to indicate the relative values of sterling and any other currency. Thus, he may cable his agent in Prague: " Sell £500 or Sw. Fcs. 8515, whichever better."

If his agent replies: " Sold £500 121", he knows that the agent has sold a T.T. on him for £500, at Kr. 121 = £1, realising Kr. 60,500. In effect, the London dealer has obtained Kr. 60,500 for £500.

By wording his cable as above, the dealer indicates to his agent that, in London, £500 was equivalent to Sw. Fcs. 8,515; consequently, if his agent could obtain more kronen for one currency than for the other, he was to sell that currency which produced most kronen.

Covering Operations.—Usually, the orders received by a London dealer from abroad instruct him to buy or to sell a foreign currency *against sterling*, but sometimes he is instructed to buy or to sell one foreign currency *against another foreign currency*, probably at limited rates.

A London dealer may be instructed to buy francs against marks, i.e., to buy francs and to cover by selling marks, or he may be instructed to sell dollars and to cover by the purchase of Swedish kronor. The correspondent may supply the dealer with limited rates applicable to both currencies, or, as is often the case nowadays, he will merely supply a limited rate for the exchange between the two currencies concerned.

Whichever method is adopted, it devolves upon the dealer who has to carry out the transaction to determine whether the existing rates for the currencies involved are such as to enable him to execute the order with advantage to his correspondent whilst retaining the usual profit or " turn " for himself.

If the agent supplies two limited rates, and market quotations for both currencies have improved, the operation can, of course, be carried through, whereas if both have got worse for the particular transaction, i.e., purchase or sale, as the case may be, the order cannot be executed. Frequently, however, one rate improves while the other gets worse, and in this case it is necessary to determine whether the gain on one compensates for the loss on the other.

Theoretically, we may do this by the simple arithmetical process of expressing improved rates as *improper* fractions, and deteriorated rates as *proper* fractions, thereafter simplifying into decimal quantities. An improvement is indicated by a quantity above unity, whereas deterioration is shown by a decimal. If the amount by which one fraction falls short of unity is made good by the excess of the

other fraction above unity, then the operation can be made, and the simplest way to determine this is to add the two quantities, and find if they are greater or less than 2.

Example 7.
Order: Buy francs @ 124·25; sell marks @ 20·40.
Present rates: Paris 124·20, Berlin 20·38.

Solution :—
For buying Paris has deteriorated, for selling Berlin has improved, and if the improvement compensates for the loss the order can be executed.

$$\text{Worse rate, Paris} = \frac{124\cdot20}{124\cdot25} = \cdot9996$$

$$\text{Better rate, Berlin} = \frac{20\cdot40}{20\cdot38} = \underline{\frac{1\cdot0009}{2\cdot0005}}$$

The operation can therefore be conducted, as the loss on one transaction is more than made up by the gain on the other.

Example 8.
Order: Buy francs @ 124·25; sell Buenos Aires @ 47½.
Present rates: Paris 124·30, Buenos Aires 47⅜.

Solution :—
Paris is better for buying, Buenos Aires (in sterling) worse for selling

$$\text{Better rate} = \frac{124\cdot30}{124\cdot25} = 1\cdot0004$$

$$\text{Worse rate} = \frac{47\cdot375}{47\cdot5} = \underline{\frac{\cdot997}{1\cdot9974}}$$

The order cannot be executed.

Example 9.
Order: Remit to Berlin @ 20·38; draw * on Amsterdam @ 12·11.
* In transactions of this kind "*remit*" means *buy* the foreign currency and "*draw*" means *sell* it.
Present rates: Berlin 20·41, Amsterdam 12·12.

Solution :—

$$\text{For buying Berlin is better, } \therefore \frac{20\cdot41}{20\cdot38} = 1\cdot0014$$

$$\text{For selling Amsterdam is worse, } \therefore \frac{12\cdot11}{12\cdot12} = \underline{\frac{\cdot9991}{2\cdot0005}}$$

Order can just be executed.

Equivalent Rates.—The method given under the last heading is only a rough-and-ready method that is not mathematically exact, and it cannot be relied upon where the margin above or below 2 is very small or where wide fluctuations have occurred. A more accurate method is to take the present price which has improved, and to calcu-

late, by proportion, the value of the other rate to which the banker is limited if he wishes to carry through the operation without loss.

To do this, express the two limited rates and the improved present price as ratios, representing the unknown value of the deteriorated rate by x. When x is determined, it is then a simple matter to decide whether the actual present rate given will enable the transaction to be completed or not.

Example 10.
Order: Buy francs @ 124·30; sell marks @ 20·41.
Present prices: Paris 124·25, Berlin 20·40.

Solution :—
Berlin has improved for selling, therefore the Paris rate can get worse for buying, i.e., go down. Find how low the Paris rate can fall and yet permit the transaction to be carried through without loss.

$$\therefore \frac{20\cdot41}{20\cdot40} = \frac{124\cdot30}{x}, \quad \therefore x = \frac{124\cdot30 \times 20\cdot40}{20\cdot41} = 124\cdot24 \text{ (approx.)}.$$

This indicates that the Paris rate at 124·24 would just permit the operation to be made without loss, but as the present rate of 124·25 is higher than this, the order can be profitably executed.

Example 11.
Order: Buy francs @ 124·35; sell Argentine pesos @ 47$\frac{7}{16}$.
Present rates: Paris 124·50; Buenos Aires 47¼.

Solution :—
Paris has improved for buying, therefore Buenos Aires can get worse for selling without loss, i.e., the rate can fall, so find equivalent rate :—

$$\therefore \frac{124\cdot50}{124\cdot35} = \frac{47\cdot4375}{x}, \therefore x = 47\tfrac{3}{8} \text{ (approx.)}.$$

At the rate of 47⅜ on Buenos Aires, the order could just be executed without loss, but the Buenos Aires rate has dropped further, to 47¼, so the order cannot be completed.

Equivalent rates are also required where only one present rate is given, and it is necessary to determine the limit in the price for the other operation.

Example 12.
Order: Buy francs @ 124·43; sell marks @ 20·43.
Present price of francs is 124·30, what is the equivalent rate on Berlin at which the operation can be made without loss?

Solution :—
Paris is worse for buying, therefore Berlin must improve for selling, i.e., *go down.*

$$\therefore \frac{124\cdot43}{124\cdot30} = \frac{20\cdot43}{x}, \therefore x = 20\cdot408$$

The Berlin rate must drop to 20·408 *or less* to prevent loss. In other words

since more has to be paid for francs, more must be obtained for the marks sold to cover.

Example 13.
Order: Buy lire @ 92·25; sell Argentine pesos @ $47\frac{5}{16}$.
Present price on Milan is 92·45, what rate on Buenos Aires can be used if no loss is to be incurred?

Solution :—
Milan is better for buying, therefore Buenos Aires can get worse for selling, or *go down* in sterling, consequently because I can buy lire at a cheaper rate than the limit fixed by my correspondent, I can accept slightly less for pesos.

$$\therefore \frac{92\cdot45}{92\cdot25} = \frac{47\cdot3125}{x}, \therefore x = 47_{3}^{7}{}_{2} \text{ (approx.).}$$

Example 14. *Sale of Dollars against Kroner.*
A London dealer receives a cable from his Oslo correspondent "Sell fifty thousand dollars limit 37375". If the brokers call Oslo 18·20-23 and New York $4\cdot86\frac{7}{8}-\frac{2}{3}\frac{9}{2}$, can the dealer execute the order at a profit to himself, and if so, of how much, expressed as cents in the dollar rate?

Solution :—
The correspondent must get for each dollar not less than 3·7375 kroner, which the dealer can buy in the market at Kr.18·20 per £1.
By Chain Rule, the dollar parity is:—

? \$ = £1.
£1 = 18·20 K (the rate at which kroner are offered in London, i.e., the Market's selling rate).
Kr. 3·7375 = \$1.

$$\frac{18\cdot20}{3\cdot7375} = \$4\cdot86956$$

Therefore, at the limit given in the telegram, the dealer would be purchasing the dollars from his correspondent on a basis of approximately $\$4\cdot86\frac{6}{6}\frac{1}{4}$ per £1. He can sell them in the London Market at $4\cdot86\frac{2}{3}\frac{9}{2}$, and thus get a gross profit of

$$\$4\cdot86\frac{6}{6}\frac{1}{4}-4\cdot86\frac{2}{3}\frac{9}{2} = \frac{3}{6}\frac{}{4} \text{ cents per £1.}$$

Comparison of Rates at Two Centres.—There are generally two distinct rates of exchange between any two centres at the same time. For instance, between Madrid and London there is the London rate on Madrid, and also the Madrid rate on London. Either or both of these may be short or long rates, or the method of quotation may differ in some other respect. If the rates are both short, they are usually tending towards equality, whereas if they are long rates they may differ by the period which they have to run, and also by the difference between the interest calculated at the home and foreign discount rates.

It is frequently necessary to compare these direct rates existing at two centres, in order to determine the most advantageous method for transferring funds or for paying debts.

In order to make the comparison, the rates on the two centres must be reduced to the corresponding short rates if they are not already so expressed, and both rates must be expressed in the same terms.

There are three cases to be considered:—

(1) If both short rates are given, and they are quoted in the same way, they can be compared at once.
(2) If one short rate is quoted in a different way from the other, e.g., one in sterling and the other in currency, a calculation is necessary to express one in the same way as the other.
(3) If a long rate or long rates are quoted, they must be reduced to short rates by adding or subtracting interest for the period quoted at the foreign discount rate, afterwards changing them to quotations of the same kind. The interest must be taken into calculation because it affects the two rates concerned in opposite ways. Allowances for stamp and risk and for other charges can be neglected, because they are usually too small to affect the result. If, however, they are appreciable, they must be adjusted in the usual way.

To Determine which Rate is Best for Remittances or Returns.—When any necessary calculation has been made, and both rates are expressed at the short prices in the same terms, it is possible to decide which of the two rates can be more advantageously used for the transfer of money. For the sake of clearness, the operations are considered from the London point of view, but the application of the theory is the same wherever the dealings take place.

In exchange operations in England, the term "remittances" is used for transfers of money from England to foreign countries, and the expression "*returns*" for transfers to England from other countries. In other words:—

For *remittances*, England is the *debtor* and must pay.
For *returns*, England is the *creditor* and should receive.

Remittances.—Money leaving England.

(1) London can buy and remit currency of the foreign centre in the form of T.T., M.T. or bills on that centre, i.e., London is a *buyer* of the foreign currency against payment of sterling; *or*

(2) The foreign centre can offer sterling for sale, in the form of drafts, M.T. or T.T. on London. In this case also London pays out sterling.

Returns.—Money from abroad to England.

(1) London can sell the currency of the foreign centre as drafts, T.T. or M.T., i.e., London is a *seller* of foreign currency and recipient of sterling ; *or*

(2) The foreign centre can buy and remit sterling in T.T., M.T. or bills on London. Here again London receives sterling.

Example 15.

London on Paris short rate = 124·18.
Paris on London short rate = 124·20.

Which rate is the better for remittances from London, and how should payment be made?

Solution :—

As sterling is worth more francs in Paris than in London, it is better to use the Paris rate, and the agent or creditor in France should be asked to draw on London.

Example 16.

London on Monte Video short rate = 47½ pence per dollar.
Monte Video on London long rate = 48 „ „
Discount in London 5 %, Monte Video 6 %.

Which is the better rate for returns from Monte Video, and how should payment be obtained?

Solution :—

Monte Video on London long rate	=		48
3 mos. interest at 5 %	=	·6	
Stamp and risk at 1 per mille	=	·048	
		——	·648
Short rate on London	=		47·35
London short rate	=		47·50

England has a higher sterling rate, so a London creditor should draw on Monte Video, thereby obtaining more pence.

Example 17.

The following rates are quoted on a given date:—

London cheque rate on Paris 124·20; Rate in Paris for three months prime bankers' bills on London 122·85.

London T.T. rate on Buenos Aires 47$\frac{13}{32}$d.; Buenos Aires 90-day sight rate on London 48$\frac{1}{4}$d.

If interest in London is allowed at 4 %, find the best rates for remittances and returns (*a*) between London and Paris; (*b*) between London and Buenos Aires. Allow ½ per mille for English stamps, but neglect all other charges.

Solution :—

REDUCTION TO SIMILAR RATES:—

London cheque rate on Paris		124·20
Paris on London, 3 months		122·85
Add interest at 4 %		1·23
„ stamp, ½ per mille		·06
Cheque rate (approx.)		124·14
London T.T. rate on Buenos Aires		$47\frac{19}{32}$
Buenos Aires on London, 90 days' sight		48·25
Less interest at 4 % for, say, 104 days (London terms) ..	·55	
„ Stamp duty	·024	
	——	·574
T.T. rate (approx.)		47·676

Say, $47\frac{43}{64}$d.

APPLYING THE FOREGOING RULES to these rates, we see that—

For Remittances.—London the debtor :—

(1) London has the higher currency rate, therefore it is best to buy francs in London. Fcs. 10,000 will cost less at 124·20 than at 124·14 per £1.

(2) London has a lower sterling rate, therefore it is best to buy pesos in London. Payment of a debt in pesos costs less at $47\frac{19}{32}$ pence than at $47\frac{43}{64}$ pence.

For Returns.—London the creditor:—

(1) London has a higher currency rate, therefore it is best to buy sterling *in Paris*. It costs a Frenchman less francs to pay £1,000 in London at 124·14 than at 124·20.

(2) London has a lower sterling rate, therefore it is best to buy sterling in Buenos Aires. It costs fewer pesos to pay a debt of £1,000 at $47\frac{43}{64}$d. than at $47\frac{19}{32}$d. per peso.

Choice of Rates for Covering Operations.—The principles which have been explained above in relation to the choice of rates are applied by an exchange dealer to the whole of his operations. Whenever he has reason to buy or sell a given currency he compares the rates ruling in his own centre with those ruling in other centres, and he carries out the operation through that centre which quotes the most favourable rates.

Example 18.—In the *Morning Post* of 2nd November, 1932, the following quotations appeared in the table of New York Exchange Rates:—

Buenos Aires on New York Gold .. 171·00 (*i.e.*, 171 *gold pesos per* $100).
New York on Buenos Aires Paper .. 25·75 (*i.e.*, 25·75 *cents per paper peso*).

A New York operator wishes to buy $oro 100,000 (i.e., 100,000 gold pesos) T.T. Buenos Aires. Is it better for him to do the deal in New York or Buenos Aires?

Solution :—

The first rate is equivalent to $\frac{100}{1\cdot71} = 58\cdot4795$ cents per gold peso.

The second rate is equivalent to $\frac{25 \cdot 75}{\cdot 44} = 58 \cdot 5227$ cents per gold peso.

It will therefore be better for the operator to do the deal in Buenos Aires.

Cheque against T.T.—Sometimes a dealer in London can take advantage of the spread between T.T. and cheque rates in order to make use of his sterling funds for the mailing period. For instance, he may cable to his agent in New York: "Against spot buy £100,000 cheque London *Mauretania*", meaning that the agent is to buy a cheque on London for £100,000 and to remit it on the *Mauretania* (which sails that day). At the same time the agent is to sell a T.T. on London for £100,000. Thus, the London banker will be out of funds in London for the period which must elapse before the cheque arrives. He will, however, gain the interest represented by the margin between cheque and T.T. rates.

Thus, if his agent answers: "Bought £100,000 cheque 5·0112 against 5·0143", this means that the cheque was bought at $5 \cdot 01\frac{1}{8}$ and T.T. was sold at $5 \cdot 01\frac{7}{16}$.

Thus the banker gains $\frac{5}{16}$ c. on each £1, or $\frac{5}{16}$ c. on \$5·01$\frac{1}{8}$, equivalent to:—

$$\frac{5}{16} \times \frac{100}{501 \cdot 125} \%$$

Since the cheque will be presented in eight days, the gain is

$$\frac{5}{16} \times \frac{365}{8} \times \frac{100}{501 \cdot 125} \% \text{ per annum.}$$

Say, $2\frac{27}{32}$ % per annum.

A similar operation can be effected by selling cheque on New York against a purchase of T.T. In this case the London banker obtains the use of *dollars* at the cost of the spread between the two rates.

CHAPTER XXIX

ARBITRAGE

SOME of the characteristics of modern arbitrage in exchange have been explained in Chapter VI. As is there pointed out, the close inter-communication between the various financial centres tends to reduce the opportunities for profitable arbitrage to a minimum. The relative values of the world's most important currencies tend to equality in all the leading centres, and any disparity is so quickly noticed and taken advantage of that it almost immediately disappears. Naturally, this tendency is less marked between centres which are so far apart that cable messages take some hours to reach their destination. The distance between London and Kobe is so great that appreciable differences might arise in their respective rates on each other were it not that New York, which has much the best market in Japanese yen, is largely used as an intermediary. Again, the difference in time between some centres makes it possible for the rate in one centre to continue moving after the other centre is closed, with the effect of restricting the number of hours during which arbitrage can be effected.

Joint Operations.—Whilst the majority of arbitrage deals are "nostro" operations, i.e., transactions worked independently for its own profit by the house instituting the business, a considerable number are conducted as "joint ventures", i.e., on joint account between the two houses concerned, which share expenses and divide profits or losses, as the case may be. The transactions in such circumstances are usually passed over the *vostro* accounts of the two participants, and, as a rule, no commission is charged or allowed for the actual conduct of the dealings. In most cases, joint operations are initiated when one of the parties, who sees a likely source of profit in a given transaction, instructs the other dealer by telephone or cable to buy or to sell a specified amount of a given currency on joint account.

By way of illustration, we may suppose that dollars are quoted in London at $4\cdot86\frac{1}{4}-\frac{3}{8}$, and that the dealer in Lloyds Bank receives advice from New York that sterling is being quoted there at $4\cdot85\frac{7}{8}-\cdot86\frac{1}{8}$.

Seeing a chance of making a profit from a direct arbitrage between the two centres, he buys T.T. 250,000 on New York in London at, say, $4 \cdot 86\frac{1}{4}$, and cables his New York correspondent to cover by buying sterling at best or at a limit, e.g., " Buy joint stlng 50000 best " or " Limit 48612 buy joint stlng 50000 ". On executing the order, the New York dealer cables " Boght fftho 48612 joint ", specifying the rate which he was able to obtain.

Alternatively, the London dealer may make a profit on dollars by cabling his correspondent in that centre somewhat as follows: " *Best posel fftho joint* ", i.e., " At the best rate obtainable, sell $50,000 on our joint account ". In due course, New York will cable, say, " *Sldjt* fftho 48612 ", and, on receipt of the message, the London dealer will cover by purchasing dollar T.T. at the best rate obtainable in London, say, $4 \cdot 86\frac{1}{4}$, immediately advising his correspondent of the fact so that the latter will know how the transaction has worked out.

In due course, the equivalents in dollars and sterling pass to the respective vostro accounts, and the deals are confirmed by mail, showing a joint profit of $\frac{1}{8}$ cent in the rate divisible between the two parties, less any expenses, brokerage, etc., incurred.

It will be seen that direct arbitrage is based on the same principles as were explained in the last chapter in connection with the choice of rates for drawings and remittances. The dealer keeps a close watch on rates in foreign centres as well as on those in his own centre, and, whatever deal he contemplates, whether a simple arbitrage, a covering operation or a transfer of his funds for investment, he will always carry out each operation in that centre where he can get the most favourable rate.

Indirect Arbitrage.—At the present time the possibilities of profit from such direct arbitrage are at a minimum, and dealers find greater opportunity in *indirect* operations. Naturally, no dealer will exchange one currency direct for another if he can more profitably effect the transfer by an *indirect exchange*, i.e., by making use of one or more intermediate currencies in order to effect the ultimate conversion. Such arbitrations in exchange are termed *simple* or *compound* according as there is one intervening currency or more than one, and, as was explained in Chapter VI, the rate of exchange calculated between two currencies by reference to their respective values in terms of a third currency is called a simple " arbitrated parity " or a simple " arbitrated rate " between the two currencies. If more than three currencies are involved, the calculated rate is known as a *compound arbitrated rate*.

Suppose, for example, that a London dealer wishes to transfer Fcs. 1,000,000 to Paris, either to meet maturing obligations or to take advantage of a high interest level in that centre. His close touch with the London Foreign Exchange Market will keep him well apprised of the tendency of francs in terms of sterling, whilst his morning mail from Continental correspondents and his subsequent telephone and telegraphic communications to and from them will keep him informed of the tendency of francs in the European markets. Hence he will determine how the *direct* rate of exchange London on Paris compares with the sterling cost of francs bought with florins in Amsterdam, marks in Berlin, lire in Milan, and so on. In other words, he will compare the direct rate on Paris with the *simple arbitrated rate* between London and Paris, calculated by reference to the direct rate between sterling and each of the principal European currencies and the *cross rate* between each of those currencies and the franc. Having made his calculations he will use that rate, direct or indirect, which yields him most francs per £1.

Tables of Equivalent Rates.—These are tables of varying rates of exchange between certain currencies compiled with the object of enabling the dealer to say almost at a glance what rate is established between two currencies by the intervention of a third currency at a given rate. The following simple example illustrates the method of compiling such a table for determining the equivalent rate between London and Paris when the London T.T. rate on Amsterdam is known and also the cheque rate on Amsterdam in Paris:—

EQUIVALENT RATES.

LONDON, PARIS AND AMSTERDAM.

Rate for T.T., Amsterdam, in Paris.	Rates for Paris, given T.T. rate London on Amsterdam.					
	12·08	12·09	12·10	12·11	12·12	12·13
—	—	—	—	—	—	—
1026	123·94	124·043	124·146	124·249	124·351	124·454
1026·25	123·971	124·074	124·176	124·279	124·381	124·484
1026·50	124·001	124·104	124·207	124·309	124·412	124·514
1026·75	124·031	124·134	124·237	124·339	124·442	124·544
1027	124·061	124·164	124·267	124·37	124·473	124·575
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—

Suppose, for example, that when the London T.T. rates on Amsterdam are 12·08–·10, a London dealer is advised that T.T. Amsterdam can be sold in Paris at 1026. On reference to the table, the dealer finds that the equivalent rate for francs is 123·94. Hence, if he is a buyer of francs, and cannot get them in London at such a good rate as this, e.g., if the London rates are 123·93–·95, he may buy T.T. on Amsterdam at 12·08 and instruct his agent in Paris to sell florins at 1026. In using the table, the dealer must, of course, be most careful to allow for any necessary brokerages and expenses involved in the indirect exchange.

These tables are of considerable utility in connection with instructions received by cable embodying orders to buy or to sell one currency against another at a given rate. Thus, a London dealer may receive a cable from New York:—

"391 *Byspt Paris five milln.*"

This rate means $3·91 per 100 francs, and, in order to determine whether he can execute the order, the London operator uses his Loga calculator, or, for greater accuracy, his Madas machine, to find that the quotation of 3·91 is equivalent to the following London rates on Paris and New York respectively:—

	124·00 and	4·8484,
	124·01 ,,	4·848791,
	124·02 ,,	4·849182,
	124·03 ,,	4·849573,
	124·04 ,,	4·849964,
or	124·05 ,,	4·850355.

If, therefore, he is to execute the American order and keep a margin of two centimes for his expenses and profit, he must be able to buy the francs at 124·03 and sell the dollars at 4·848791 (roughly $4·84\frac{7}{8}$) or at 124·05 and 4·849573 (roughly $4·84\frac{31}{32}$), and so on.

With such aids to the arithmetical processes involved in exchange dealing, the skill of the operator makes itself evident mainly in the speed with which he seizes upon a likely opportunity for profit, in the foresight or judgment which he displays in anticipating the course of rates in the immediate future, and in the care which he exercises in ensuring that proper allowance is made for all necessary expenses and charges. At the same time, it must be remembered that involved arbitrage operations are not possible unless the house concerned is of

good credit and can deal freely through a network of agents and correspondents in the principal financial centres.

Example 1.—You wish to buy $50,000 against French francs. You are offered a rate of 25·43 francs per dollar from one quarter and 3·92 cents per franc from another. Which is the better rate from your point of view?

Solution:—

The reciprocal parity of 25·43 is $\frac{100}{25 \cdot 43} = 3 \cdot 93236$ cents per franc.

As this is a higher rate than 3·92, the rate of 25·43 is the better for buying dollars, since more dollars will be obtained for each franc.

Example 2.—If francs are quoted in London at 83 and U.S. dollars at 3·27, what would you expect the cross rate to be?

Solution:—

By Chain Rule—

? Fcs. = $1
$3·27 = £1
£1 = Fcs. 83
= Fcs. $\frac{83}{3 \cdot 27}$

∴ Expected cross rate = Fcs. 25·38 per $1.

Example 3.—Buy $100,000 in Amsterdam at 2·49 and sell the dollars in London at 3·51¼. Hence work out the profit when the London brokers can deal with your bank at 8·75½–·76½ for T.T. Amsterdam.

Solution:—

$100,000 at 2·49 cost Fls. 249,000

	£	s.	d.
Fls. 249,000 can be bought in London @ 8·755, costing	28,440	17	10
$100,000 @ 3·5125 realise	28,469	15	0
Profit (ignoring expenses)	£28	17	2

Example 4.—London quotes T.T. on Amsterdam at 12·11–12·11½, while in Paris, T.T. on Amsterdam sell at 1026. What indirect rate of exchange between London and Paris is established for buying francs, allowing brokerage at 1 per mille, and other expenses at 1 per mille?

Solution:—

To effect an indirect purchase of francs with the rates quoted, the London dealer must buy florins in London and sell them in Paris for francs; therefore—

? Fcs. = £1
£1 = 12·11 florins (market *selling* rate to the dealer)
Fls. 100 = 1,026 francs
= $\frac{12 \cdot 11 \times 1026}{100}$ = Fcs. 124·2486
Allow two brokerages @ 1 per mille and other expenses @ 1 per mille .. .. ·37275
Indirect rate *via* Amsterdam .. Fcs. 123·87585 per £1.

Example 5.—On a given day the following market rates are quoted:—

In London.		In Paris.	
Paris	124·30–·35		
Amsterdam	12·12–½	Amsterdam	Fcs. 1026–·25 per Fls. 100
Berne	25·25–¼	Berne	,, 492·5–·75 per Fcs. 100
Berlin	20·43–½	Berlin	,, 608–·50 per Mks. 100

Find the indirect rates between London and Paris at which a London dealer can operate by using each of these centres, and decide which is the best rate for (*a*) paying Paris, i.e., buying francs; (*b*) receiving from Paris, i.e., selling francs.

Allow for brokerage at $\frac{1}{10}$ per mille on each purchase or sale, and for other expenses at $\frac{1}{10}$ per mille on the indirect operations.

Solution:—

Buying Francs.		Selling Francs.	
	Direct Rates.		
Market rate	124·300	Market rate	124·350
Less brokerage, $\frac{1}{10}$ per mille	·012	*Add* brokerage, $\frac{1}{10}$ per mille	·012
	124·288		124·362

Amsterdam.

? Fcs. = £1
£1 = 12·12 florins (buying)
Fls. 100 = 1,026 (selling)

$$\therefore \frac{12\cdot12 \times 1026}{100}$$

= Fcs. 124·351

Less two brokerages @ $\frac{1}{10}$ per mille and expenses $\frac{1}{10}$ per mille ·037

Fcs. 124·314

? Fcs. = £1
£1 = 12·125 florins (selling)
Fls. 100 = 1026·25 (buying)

$$\therefore \frac{12\cdot125 \times 1026\cdot25}{100}$$

= Fcs. 124·433

Add two brokerages @ $\frac{1}{10}$ per mille and expenses $\frac{1}{10}$ per mille ·037

Fcs. 124·470

Berne.

? Fcs. = £1
£1 = 25·25 Swiss Fcs. (buying)
Sw. Fcs. 100 = 492·5 French Fcs. (selling)

$$\therefore \frac{25\cdot25 \times 492\cdot5}{100}$$

= Fcs. 124·356

Less brokerages, etc., as above .. .. ·037

Fcs. 124·319

? Fcs. = £1
£1 = 25·2525 Swiss Fcs. (selling)
Sw. Fcs. 100 = 492·75 French Fcs. (buying)

$$\therefore \frac{25\cdot2525 \times 492\cdot75}{100}$$

= Fcs. 124·432

Add brokerages, etc., as above .. .. ·037

Fcs. 124·469

Berlin.

? Fcs. = £1
£1 = 20·43 Mks. (buying)
Mks. 100 = 608 Fcs. (selling)

$$\therefore \frac{20{\cdot}43 \times 608}{100}$$

= Fcs. 124·214
Less brokerages, etc. .. ·037
Fcs. 124·177

? Fcs. = £1
£1 = 20·435 Mks. (selling)
Mks. 100 = 608·5 Fcs. (buying)

$$\therefore \frac{20{\cdot}435 \times 608{\cdot}5}{100}$$

= Fcs. 124·347
Add brokerages, etc. .. ·037
Fcs. 124·384

COMPARISON OF RATES:

	Buying.	*Selling.*
Direct	£1 = Fcs. 124·288	£1 = Fcs. 124·362
By using Amsterdam	£1 = „ 124·314	£1 = „ 124·470
„ Berne	£1 = „ 124·319	£1 = „ 124·469
„ Berlin	£1 = „ 124·177	£1 = „ 124·384

The best rate for *buying* French currency or paying France is the one that yields the largest number of francs per £1. This is shown to be the indirect rate obtained by purchasing Swiss francs and selling them for francs, i.e., the indirect rate *via* Berne. The best rate for *selling* French currency, or receiving payment from France, is the one that yields the highest amount in sterling, i.e., the direct rate, London on Paris.

So for (*a*) *Remittances*, the indirect rate *via* Berne, 124·319, is best.
(*b*) *Returns*, the direct rate on Paris, 124·362, is best.

Example 6.—**A London exchange dealer purchases 100,000 T.T. Madrid in New York at $14·60 per 100 pesetas and sells them in London at 33·25 to the £1. He covers his dollars against sterling at 4·86¾. What profit or loss does he make on the transaction?**

Solution:—

T.T. New York on Madrid costs $14·60 per 100 pesetas.
The cost in New York of 100,000 Madrid is $1,000 × 14·60 = $14,600.

	£	s.	d.
∴ Cost in sterling = $\frac{£14,600}{4{\cdot}86\frac{3}{4}}$ =	2,999	9	9
Proceeds of sale of 100,000 Madrid at 33·25 = $\frac{100,000}{33{\cdot}25}$ =	3,007	10	5
∴ Profit on the transaction =	£8	0	8

exclusive of brokerage and cablegrams.

Example 7.—**A London arbitrageur purchases a T.T. on Prague for one million kronen against dollars at Kr. 33·925 per $1. He sells the kronen in London at 165 and covers the dollars at 4·86½. What profit or loss does he make on the transaction?**

Solution:—

Dollar cost of Kr. 1,000,000 at 33·925 = $29,476·78

	£	s.	d.
$29,476·78 @ 4·86½ cost	6,058	19	0
Kr. 1,000,000 @ 165 realise	6,060	12	1
Profit, excluding expenses	£1	13	1

Example 8.—T.T. Kobe is quoted in New York at 21·96–·99 (cents per yen), while the current quotation in London is 1s. $3\frac{5}{16}$–1s. $4\frac{1}{16}$d.

(*a*) Assuming that a London banker can obtain exchange at these prices, which is the better market for a purchase of 250,000 yen when brokers tell the dealer they are firm at $3·29\frac{1}{8}$–$\frac{3}{8}$ for the dollar?

(*b*) Calculate the cost of the yen in accordance with your decision.

Solution:—

(*a*) The banker has two alternatives:—

(1) He can purchase the yen in London at 1s. $4\frac{1}{16}$ = 16·0625d.

(2) He can purchase the yen in New York at an indirect rate of $\frac{240 \times \cdot2199}{3·29125}$d. = 16·035245d. per yen.

He will therefore choose the indirect rate via New York, which is the cheaper.

(*b*) The cost of the yen will be

$$£\frac{250{,}000 \times 16·035245}{240} = \underline{£16{,}703\ 7s.\ 7d.}$$

Example 9.—In Paris there are dealers in Swedish kronor at 437½–9 (francs per Kr. 100), and sterling is quoted at 83·55–·78. A French banker, who can cover at the prices quoted, telephones to London asking his English correspondent to make him a dealing price in Stockholm. The London banker quotes him firm at $19\frac{1}{16}$–$\frac{3}{16}$. Can the French banker deal on this call?

Solution:—

Two courses are open to the French banker: (*a*) He can buy kronor from the London banker and sell these against francs, or (*b*) He can sell kronor to the London banker, buying direct cover in Paris.

(*a*) *By Chain Rule*—

? Fcs. = 100 kronor
if Kr. 19·0625 = £1
and £1 = Fcs. 83·78

$$\frac{8378}{19·0625} = \underline{\text{Fcs. } 439·5016}$$

∴ It will not pay the French banker to buy kronor in London, for each 100 kronor, which would cost him over 439½ francs *via* London, would realise only 437½ francs by a direct sale in Paris.

(*b*) *By Chain Rule.*

? Fcs. = Kr. 100
If Kr. 19·1875 = £1
and £1 = £83·55

$$\frac{8355}{19·1875} = \underline{\text{Fcs. } 435·5}$$

∴ It will not pay the French banker to sell kronor to London, as a direct purchase would cost him Fcs. 439 per Kr. 100, and would realise only Fcs. 435½.

The French banker cannot, therefore, deal on this call.

Example 10.—New York offers Paris at 3·93⅛ (i.e., dollars per Fcs. 100), while in Paris dollars are offered for 25·44. A London dealer hears from his brokers that the market here is 3·28–½ and 83¼–½ for the currencies concerned. Can the London banker take advantage of these offers in any way?

Solution:—

(1) Assuming the banker buys the francs in New York, he will obtain 100 francs for an expenditure of 3·93⅛ dollars, and these dollars he will have to buy in London at 3·28.

Hence, by Chain Rule—

? How many francs = £1
if £1 = $3·28
and $3·93125 = 100 francs

$$\frac{1 \times 3{\cdot}28 \times 100}{1 \times 3{\cdot}93125} = \underline{\text{Fcs. } 83{\cdot}40}$$

As he cannot sell francs in London at a better price than 83·50 per £1, it will not pay him to buy francs in New York.

(2) Ascertain whether or not a cross-transaction between the two offers will pay (i.e., buying the francs in New York and selling them in Paris for dollars).

In Paris, Fcs. 25·44 are wanted for a dollar.

∴ Fcs. 100 will buy

$$\$\frac{100}{25{\cdot}44} = \underline{\$3{\cdot}9307}$$

As this will not be sufficient to buy Fcs. 100 in New York (where 3·93⅛ are asked) no cross-transaction will pay.

(3) Assuming the London dealer buys New York in Paris—

Then: How many $ = £1
if £1 = Fcs. 83¼ (his buying price in London)
and Fcs. 25·44 = $1

$$\frac{8325}{2544} = \underline{\$3{\cdot}272}$$

But as the dealer cannot sell dollars in London at a better rate than 3·28½, he cannot afford to buy dollars in Paris.

Example 11.—A dealer has oversold his U.S. dollar position and, in seeking to cover it, he enquires of his broker the market rates for dollars, which are:—

New York	..	3·26⅛–¼
Montreal	..	3·58⅝–¾

He now receives a cable from his Canadian correspondent:—

"OFFER YOU NEW YORK 9¾ PREMIUM RUSH"

How will he act? Ascertain the cost of $100,000 U.S. in accordance with his decision.

Solution:—

He can buy the U.S. dollars in London at $\underline{3 \cdot 26\frac{1}{8}}$,

or

He can buy them in Canada, receiving 100 U.S. dollars for $109\frac{3}{4}$ Canadian dollars. He will then have to cover by buying Canadian dollars in London at $3 \cdot 58\frac{5}{8}$.

∴ By Chain Rule—

How many U.S. $ = £1
if £1 = $3·58625 Can.
and $109·75 Can. = $100 U.S.

$$\frac{358 \cdot 625}{109 \cdot 75} = \underline{3 \cdot 2676}$$

It will therefore be cheaper to buy the U.S. dollars through Canada, and, on the basis of this decision, $100,000 will cost:—

$$£\frac{100{,}000}{3 \cdot 2676} = \underline{£30{,}603\ 10s.\ 0d.}$$

Example 12.—A French banker sends the following cable to his London correspondent, an Eastern Exchange banker:—

"CAN YOU DEAL CALCUTTA 620–25 OUR TERMS COUNTER"

On receipt of this cable, the London banker is prepared to deal in rupees at $1/6\frac{3}{16}-\frac{5}{16}$. The market quotation on Paris is 82·25–·30. Ignoring brokerage, etc., ascertain whether the London banker can take advantage of the French banker's dealing prices.

Solution:—

The cable may be construed to mean: "Can you buy from me rupees at Fcs. 6·25 each, or sell me rupees at Fcs. 6·20? If not, make counter offer."

If the London banker is to sell rupees for francs and sell the francs in London at 82·30, his rate may be calculated thus:—

? How many francs = 1 rupee
if 1 rupee = 18·3125d. $(1/6\frac{5}{16})$
and 240 pence = 82·30 Fcs.

$$\frac{18 \cdot 3125 \times 82 \cdot 30}{240} = \underline{\text{Fcs. } 6 \cdot 28}$$

Since the Paris banker offers only Fcs. 6·20 per rupee, the London banker cannot sell without loss.

If the London banker is to buy rupees for francs, obtaining the francs in London at 82·25, his rate may be calculated thus:—

? How many francs = 1 rupee
if 1 rupee = 18·1875d. $(1/6\frac{3}{16})$
and 240 pence = 82·25 Fcs.

$$\frac{18 \cdot 1875 \times 82 \cdot 25}{240} = \underline{\text{Fcs. } 6 \cdot 23}$$

Since the Paris banker requires 6·25 francs per rupee, the London banker cannot buy without loss.

The London banker can afford to sell at Fcs. 6·28 and to buy at Fcs. 6·23. Hence he could offer to deal at, say, Fcs. 6·22–·29 (his terms).

His reply would read:—

" REGRET RUPEES DEALER 622–29 "

Example 13.—A London banker has sold $100,000 to a customer at 4·86, which he wishes to cover through Stockholm. He telegraphs to his Stockholm agent:—

" BUY BEST ONE HUNDRED THOUSAND DOLLARS ", and receives the reply—

" BOUGHT ONE HUNDRED THOUSAND DOLLARS 3·725 "

If he can purchase in London the kronor necessary to cover his purchase of dollars in Stockholm at 18·12, what is his profit or loss on the transaction? Ignore expenses.

Solution:—

The banker has sold $100,000 at 4·86 for which he receives

	£	s.	d.
$£\frac{100,000}{4·86}$ =	20,576	2	8
He purchases $100,000 at Kr. 3·72½ per $ which cost him Kr. 372,500.			
He covers the kronor at 18·12 at a total cost of $£\frac{372,500}{18·12}$ =	20,557	7	11
Therefore *his profit on the transaction is*	£18	14	9

Example 14.—The dealers in a London bank are busy answering two telephone calls, one from Paris, where the French bank quotes dealing prices in Dutch florins of 1,030·50 to 1,031 (French francs per Fls. 100), and the other from Amsterdam quoting Paris at 9·70½–¾ (florins per Fcs. 100).

(*a*) These prices being " firm ", can the London bank make any profit in arbitrage using only these two centres?

(*b*) Ascertain the result of a deal utilising £10,000, if Paris can be bought in London at 84·62 and florins can be sold here at 8·21. In this case ignore entirely the quotations you have received from Paris. Expenses can be ignored.

Solution:—

(*a*) To compare the rates in Paris with those in Amsterdam it is necessary to bring them to a common basis, say, florins per 100 francs.

The rates in Paris may be converted as follows:—

$$1030·50 \text{ francs} = 100 \text{ florins}$$

$$\therefore 100 \text{ francs} = \frac{100 \times 100}{1030·5} \text{ florins}$$

i.e., 9·704 florins = 100 francs.

$$1031 \text{ francs} = 100 \text{ florins}$$

$$\therefore 100 \text{ francs} = \frac{100 \times 100}{1031} \text{ florins}$$

i.e., 9·699 florins = 100 francs.

The rates in Paris are therefore Fls. 9·699–·704 per 100 francs, and the rates in Amsterdam are Fls. 9·705–·7075 per 100 francs.

(i) Francs can be bought in Amsterdam at 9·7075 and sold in Paris at 9·699. *This is obviously unprofitable.*

(ii) Francs can be bought in Paris at 9·704 and sold in Amsterdam at 9·705. *This yields a profit (ignoring expenses).*

(*b*) Purchase of francs @ 84·62 for £10,000 = Fcs. 846,200.
Sale of francs in Holland @ 9·70½ per 100 realises

$$\frac{846{,}200}{100} \times 9{\cdot}705 = \text{Fls. } 82{,}123{\cdot}71$$

Sale of florins in London @ 8·21 realises

$$£\frac{82{,}123{\cdot}71}{8{\cdot}21} = £10{,}002\ 17\text{s. } 9\text{d.}$$

This shows a profit of £2 17s. 9d. (*ignoring expenses*).

Example 15.—An arbitrageur in London purchases a T.T. on Prague for one million kronen against dollars at Kr. 33·745 per $1. He sells the kronen in London at 164½ and covers the dollars at 4·87⅞. What profit or loss does he make on the transaction?

Solution:—

The cost in dollars of T.T. on Prague for

$$\text{Kr. } 1{,}000{,}000 = \$\frac{1{,}000{,}000}{33{\cdot}745} = \$29{,}634{\cdot}02$$

The cost in sterling is therefore $£\frac{29{,}634{\cdot}02}{4{\cdot}87\frac{7}{8}}$

£	s.	d.
6,074	2	0

The proceeds of the sale of one million Prague @ 164½

$$= £\frac{1{,}000{,}000}{164{\cdot}5}$$

£	s.	d.
6,079	0	7

His profit (less brokerage and cables) is therefore £4 18 7

Example 16.—You hear from New York that the Argentine peso is quoted there at $35·45–·55 (per M$N 100). The London quotations are 43½–44, while brokers quote New York at 4·51¾–·52¼. Ascertain whether, if you can take advantage of these prices, you can deal at a profit.

Solution:—

The London rates are for *gold* pesos.
Reducing these quotations to paper rates:—

$$\frac{43\frac{1}{2} \times 44}{100} = 19{\cdot}14\text{d.}$$

$$\frac{44 \times 44}{100} = 19{\cdot}36\text{d.}$$

(*a*) If pesos are bought in London and sold in New York, £1 will realise:—

? How many $ = £1
if £1 = 240 pence
19·36d. = 1 peso
100 pesos = $35·45
∴ £1 = $4·39462

But as dollars can only be sold in London at a higher rate ($4·52¼ = £1), *the operation is not profitable.*

(*b*) If dollars are bought in London and are used to purchase pesos in New York, each peso will cost:—

? How many pence = 1 peso
if 100 pesos = $35·55
$4·51¼ = £1
£1 = 240 pence
∴ 1 peso = 18·886d.

Since pesos can be sold in London at 19·14 pence, *this operation will be profitable.*

Example 17.—You receive the following cable from a New York bank:—

"BUYERS HUNTHOU ZURICH 25815 OUR TERMS"

In London, brokers are quoting Swiss francs at 18·11–¼ and dollars at 4·67⅛–⅜. The London banker can reckon on brokerages of ⅛th per mille and $\frac{1}{16}$th per mille respectively.

(*a*) How would you ascertain quickly whether you can accept the order?

(*b*) Show profit or loss if you execute it, allowing *actual* brokerages of 12s. 6d. on the Zurich and 8s. 6d. on the dollars.

Solution:—

(*a*) To ascertain quickly whether the offer can be accepted it is necessary to ascertain the cross rate obtained by selling dollars and buying Swiss francs.

The rates are: Sale of dollars, 4·67⅜.
Purchase of francs, 18·11.

? How many $ = 100 Swiss francs
if Fcs. 18·11 = £1
and £1 = $4·67⅜

$$= \frac{4·67375 \times 100}{18·11}$$

= $25·8076
Add Charges, $\frac{3}{16}$ per mille ·0048
$25·8124

∴ The cross-rate is $25·8124 = Fcs. 100, i.e., Fcs. 100 will "cost" the dealer $25·8124.

Hence the offer from New York of $25·815 *is acceptable.*

(*b*) Proceeds of Sw. Fcs. 100,000 at $25·815

$$= \$\frac{25·815 \times 100,000}{100}$$

= $25,815

	£	s.	d.
Sale of $25,815 @ $4·67⅜ realises	5,523	8	0
Cost of Fcs. 100,000 @ Fcs. 18·11	5,521	16	3
Profit	£1	11	9
Deduct Brokerages	1	1	0
Net Profit		10	9

Compound Arbitrage.—If time allows and rates are sufficiently steady, a dealer who wishes to transfer a considerable sum from one centre to another may examine the position of the various exchanges

with still greater care in order to determine whether he can profitably transfer the funds by making the exchange through two, or even more, currencies, i.e., by executing what is known as a *compound* arbitrage.

Compound arbitrage is sometimes described as *four-* or *five-point* arbitrage, according to the number of currencies or places involved, but, as the charges on such complicated operations increase with each intervening centre, they are nowadays very rarely undertaken.

The following examples are largely hypothetical, but they should serve to illustrate the principles involved and afford useful theoretical practice in the application of exchange rates in different centres. In all cases, the calculations are made by the Chain Rule, as in previous examples. The question of expenses and charges is necessarily of great importance, and, in circuitous operations, allowance must in certain circumstances be made for interest on the money invested for the time of the operation.

Example 18.—*London and Madrid.*

A London dealer buys T.T. on Paris at 124·15, the francs being used to buy T.T. on Berlin at 607. The proceeds are applied in purchase of T.T. on Amsterdam at 166·60. With the florins so obtained the dealer buys pesetas at 40·69. Find the compound arbitrated rate between London and Madrid, allowing for brokerage on each operation at 1 per mille and for a commission of $\frac{1}{16}$ % on each of the deals in foreign centres.

Solution:—

? Pesetas = £1
£1 = 124·15 francs
Fcs. 607 = 100 marks
Mks. 166·60 = 100 florins
Fls. 40·69 = 100 pesetas

$$\frac{124{\cdot}15 \times 100 \times 100 \times 100}{607 \times 166{\cdot}60 \times 40{\cdot}69} = \text{Pesetas } 30{\cdot}1713$$

Deduct Charges.

4 Brokerages @ 1 per mille ..	·1207	
3 Commissions @ $\frac{1}{16}$ %	·0566	
		·1773
		29·994

Compound arbitrated rate = Pesetas 29·994 per £1.

Example 19.—*London and Berne.*

A London dealer is under the necessity of making a large remittance to Switzerland, and, being in close touch with his Continental agents as well as with his own market, he is quoted the following rates:—

London on Berlin, Mks. 20·41½–·42 per £1.
Berlin on Paris, Mks. 16·325–·425 per 100 francs.
Paris on Berne, Fcs. 491·5–492·5 per 100 Swiss francs.

What is the compound arbitrated rate established if he uses all four centres? Allow brokerage at 1 per mille on each purchase or sale, and agent's commission at $\frac{1}{16}$ %.

Solution:—

? Swiss Fcs. = £1
£1 = 20·415 marks
Mks. 16·425 = 100 French francs
French Fcs. 492·5 = 100 Swiss francs

$$\frac{20{\cdot}415 \times 100 \times 100}{16{\cdot}425 \times 492{\cdot}5} = \text{Fcs. } 25{\cdot}237 \text{ per £1.}$$

Deduct Charges.

3 Brokerages @ 1 per mille	..	·0757	
2 Commissions @ $\frac{1}{16}$ %	..	·0315	
		———	·107
Compound arbitrated rate	= Fcs.	25·130	per £1.

Circuitous Arbitrage.—Compound operations in which the proceeds return to the original or operating centre or currency after passing through three or more centres or currencies are described as *circuitous arbitrations.*

By circuitous operations it is sometimes possible to make profits by a series of exchanges without employing any capital whatsoever. But operations of this kind are nowadays rarely executed, for one thing because the opportunities of making profit are few and far between, and, for another, because the dealers have little time to work out complicated operations before one or other of the rates may change unfavourably and so minimise the chances of profit. The following are illustrative examples.

Example 20.—*Circuitous Arbitration.*

A New York banker invests $500,000 in marks at 23·69, with which he buys francs at 16·42. The proceeds are applied in the purchase of sterling at 123·95. The sterling is used to buy T.T. on New York at 4·85½. What is the gross profit or loss on the operation?

Solution:—

? $ = $500,000
$23·69 = 100 marks
Mks. 16·42 = 100 francs
Fcs. 123·95 = £1
£1 = $4·855

$$\frac{500{,}000 \times 100 \times 100 \times 4{\cdot}855}{23{\cdot}69 \times 16{\cdot}42 \times 123{\cdot}95} = \$503{,}471{\cdot}04$$

∴ Gross Profit = $3,471·04

Example 21.—*Circuitous Arbitration.*

£10,000 is invested in London in T.T. on Berlin at 20·43. The marks are sold in Paris at 609. The proceeds are used to buy lire at 133, which are sold in

New York at 5·23¼. With the proceeds T.T. on London is bought at 4·85. What is the profit on the transaction? Allow for brokerages of 1 per mille on each operation.

Solution:—

? £ = £10,000
£1 = Mks. 20·43
Mks. 100 = Fcs. 609
Fcs. 133 = Lire 100
Lire 100 = $5·2325
$4·85 = £1

$$= \frac{£10{,}000 \times 20{\cdot}43 \times 609 \times 100 \times 5{\cdot}2325}{100 \times 133 \times 100 \times 4{\cdot}85}$$

= £10,092·564
Less 5 Brokerages @ 1 per mille .. = 50·463
£10,042·101

∴ Net profit = £42 2s. 0d.

Example 22.—Circuitous Operation.

£10,000 is invested in T.T. on Berne at 25·29, the francs being sold in Amsterdam at 48·22. The proceeds are used to buy sterling at 12·10. Find the profit or loss on the operation, allowing brokerage 1 per mille on each transaction.

Solution:—

? £ = £10,000
£1 = Fcs. 25·29
Fcs. 100 = Fls. 48·22
Fls. 12·10 = £1

$$= \frac{£10{,}000 \times 25{\cdot}29 \times 48{\cdot}22}{100 \times 12{\cdot}1}$$

= £10,078·378
Less 3 Brokerages @ 1 per mille .. = 30·235
Proceeds .. = £10,048·143

Net profit = £48 2s. 10d.

The above example worked in full appears as follows:—

£10,000 invested in francs @ 25·29, buys	Fcs.	252,900
Less Brokerage in London, 1 per mille		252·9
		252,647·1
Fcs. 252,647·1 sold in Amsterdam @ 48·22 realise	Fls.	121,826·43
Less Brokerage in Amsterdam, 1 per mille		121·83
		121,704·60
Fls. 121,704·6 invested in sterling @ 12·10 buys		£10,058·231
Less Brokerage in Amsterdam, 1 per mille		10·058
Amount received in London		£10,048·173

The slight difference is accounted for by the fact that, in the first method, the three brokerages are calculated on the final proceeds, whereas, in the second method, brokerage in the last two cases is calculated on the proceeds less one and two brokerages respectively. The second is, of course, the more accurate method and should strictly be adopted in answering any problems of this type.

CHAPTER XXX

EXCHANGE OPERATIONS INVOLVING FORWARD RATES

THE principles involved in calculations connected with the purchase and sale of forward currency are precisely the same as those which apply to dealings in spot currency, subject, however, to the fact that the dealer who is carrying out a forward transaction, either on his own behalf or on behalf of his customer, must keep well before him not only the current market rates for the foreign currency in question, but also the relationship between the rates of interest ruling in the foreign centres concerned. This will be clear on a consideration of the following examples.

Example 1.—If money rates in New York are 1 % p.a. higher than in London, at what rate would you expect forward dollars for three months' delivery to be quoted in London as against a spot rate of 4·86¼?

Solution :—

Since interest rates are 1 % higher in New York than in London, London forward rates on New York should be at a *discount* of approx. 1 % p.a. on the rate, i.e.:—

1 % per annum on $4·8625	..	= ·048625
1 % per 3 months on $4·8625	..	= ·012156

∴ London forward rate on New York = 1$\frac{7}{32}$ c. discount per three months.

Example 2.—From the following data, calculate at what rate a banker, operating with £1,000, can sell American dollars three months' forward "outright": Dealer's spot rate, $4·86$\frac{1}{16}$–$\frac{1}{8}$; interest in London 5 %, in New York 4 %.

Solution :—

As interest rates in New York are 1 % *lower* than in London, the dealer will charge a *premium* on the sale of forward dollars, since by covering with a spot purchase of dollars he will lose interest at 1 % p.a.

Dealer's selling rate for spot (Assumed to allow for his profit)	.. ..	$4·860625
Premium on 3 months' forward dollars (3 months @ 1 % p.a.)	.. .. ..	·012152
3 months' forward "outright" rate	..	$4·848473

Say, $4·84$\frac{7}{32}$d. per £1.

Example 3.—Given a spot rate of exchange, London on Paris, of 120½, calculate the probable three months' forward rate of exchange. The rate of interest in London is 5 % and in Paris 7½ %. Neglect other considerations.

Solution :—

Spot rate (London on Paris)		120·50 francs per £1.
London interest rate		5 % p.a.
Paris interest rate		7½ % p.a.

i.e., money earns 2½ % more in Paris than in London.

∴ the forward rate, London on Paris, will probably be at a discount of 2½ % p.a.

2½ % p.a.		⅝ % for 3 months.
T.T. rate		120·50
Add ⅝ %		·753125
3 months' forward rate, London on Paris		121·253125 francs per £1.

Say, 121¼ francs per £1.

i.e., forward francs are quoted at a discount of ¾ franc for three months.

Example 4.—If the market quotation in London for three months' forward dollars is ⅝ c. premium on a spot rate of 4·86¾, and the value of three months' money in London is 5 %, what is the probable current rate for three months money in New York?

Solution :—

As London three months' rate on New York is at a premium, the likelihood is that interest rates in the latter centre are lower than in the former.

Premium on $4·8675 for 3 months is ⅝ c.

∴ Premium on $4·8675 for 12 months is 2·5 c.

$$= \frac{\cdot 025 \times 100}{4 \cdot 8675} \%$$

$$= \cdot 513 \%.$$

∴ The probability is that the current rate for three months' money in New York is about ½ % under the London rate, i.e., about 4½ % per annum.

Quoting Forward Rates.—In Chapter XI it was explained how a banker fixes his rates when quoting for forward transactions with his customer. As a general rule a London dealer bases his forward rates for "outright" deals with his customers on the assumption that he will cover by buying or selling spot in the Market and then effecting a swap. Hence the forward rates he quotes to his customers will be calculated in accordance with the following rules:—

(*a*) For Selling Forward to Customers:—

(1) Take as basis the market selling rate for spot.

(2) If forward swaps are quoted at a premium, *deduct the premium* from the spot rate (for "*pence*" rates *add* the premium).

(3) If forward swaps are quoted at a discount, *add the discount* (for "*pence*" rates *deduct* it).

(4) *Deduct* any necessary allowance for profit, etc. (for "*pence*" rates *add*).

(*b*) FOR BUYING FORWARD FROM CUSTOMERS:—

(1) Take as basis the market buying rate for spot.

(2) If forward swaps are quoted at a premium, *deduct the premium* from the spot rate (for "*pence*" rates *add* it).

(3) If forward swaps are quoted at a discount, *add* the discount to the spot rate (for "*pence*" rates *deduct* it).

(4) *Add* any necessary allowance for profit, etc. (for "*pence*" rates *deduct*).

Example 5.—What rate should a London dealer apply in the purchase of dollars "outright" for delivery two months ahead, if the market spot rate is $4\cdot86\frac{1}{16}-\frac{3}{16}$, and forward dollars are quoted $\frac{1}{8}$ cent discount per month? Reckon the dealer's profit at $\frac{1}{16}$ cent, and other expenses (including brokerage) at $\frac{1}{32}$ cent.

Solution:—

Market buying rate for spot	$4\cdot86\frac{3}{16}$
Add 2 months' discount @ $\frac{1}{8}$ c.	$\frac{1}{4}$
Rate at which dealer can cover 2 months' forward ..	$4\cdot86\frac{7}{16}$
Add Brokerage, etc.	$\frac{1}{32}$
Dealer's profit	$\frac{1}{16}$
Dealer's "outright" buying rate, 2 months' forward ..	$4\cdot86\frac{13}{32}$

Example 6.—Rates, etc., as in the last example, calculate the rate which a dealer should apply in *selling* to a customer $50,000 "outright", one month forward.

Solution:—

Market selling rate for spot		$4\cdot86\frac{1}{16}$
Add 1 month's discount		$\frac{1}{8}$
Cost of covering for 1 month forward		$4\cdot86\frac{3}{16}$
Less Brokerage, etc.	$\frac{1}{32}$	
Dealer's profit	$\frac{1}{16}$	
	—	$\frac{3}{32}$
Dealer's "outright" selling rate, 1 month forward		$4\cdot86\frac{3}{32}$

Example 7.—Japanese currency is quoted in London on a certain date at $2/0\frac{13}{32}-\frac{15}{32}$, and a dealer is offered 100,000 yen two months' forward "outright". With what sterling equivalent will he credit his customer if the forward rate on Japan is quoted at $\frac{1}{16}$d. premium per month, and the dealer reckons his profit at $\frac{1}{16}$d. in the rate?

Solution:—

Market buying rate for spot	$24\frac{13}{32}$d.
Add 2 months' premium @ $\frac{1}{16}$d. per month	$\frac{1}{8}$d.
Dealer covers 2 months' forward at ..	$24\frac{15}{32}$d.
Less Dealer's Profit	$\frac{1}{16}$d.
Rate to be applied to the purchase ..	$24\frac{13}{32}$d.

$$\text{Sterling equivalent } £\frac{100{,}000 \times 24\cdot46875}{240}$$

$$= £10{,}195\ 6s.\ 3d.$$

Double-Barrelled Forward Quotations.—Commonly the calculation of forward rates is complicated by the fact that swaps are quoted at double-barrelled rates, e.g., 5–10 c. discount, or 10–5 c. premium. Where this is the case the dealer will usually assume that he will have to effect his swap at the least favourable rate.

Thus, if he is buying forward francs from a customer the banker will have to cover by selling spot. Next he will have to buy spot against a sale of forward. In quoting to his customer he will assume that when he comes to sell forward to the Market (against spot) he will have to give away the *larger* discount. Hence he will include the *larger* discount in the rate he quotes his customer. Thus if swaps in francs are quoted at 5–10 c. discount, he will base the rate he quotes to his customer on the larger discount—10 c., which he will add to the market buying rate for spot.

If he had been selling to the customer the banker would cover by buying spot, and then swapping the spot against a purchase of forward, for which he would assume that he would be able to obtain only the *smaller* discount, 5 c., which he will add to the market selling rate for spot.

Now let us consider the position when the rates are 10–5 c. *premium.*

In buying forward from a customer the banker will have to sell spot in the Market and then sell forward against the purchase of spot. In selling forward in the Market he will receive only the *smaller* premium, and will therefore allow his customer only 5 c.

In selling forward to a customer the banker will have to buy spot, then sell spot against a forward purchase. On the swap he will have to pay the *larger* premium for the forward currency, and will therefore charge the customer 10 c.

From this explanation it should be obvious that when swaps are quoted at a discount, the banker will give the customer the smaller discount when selling to him, and will require the larger discount when buying from him.

When swaps are at a premium the banker will charge his customer the higher premium when selling and allow him the smaller premium when buying from him.

In other words, where double-barrelled rates are quoted, the banker, when fixing his rate for his customer, uses the least favourable of the two from the customer's point of view. It will be remembered that a similar rule was enunciated on page 494 in regard to Forward Options —*Always quote that rate which is most favourable to the banker.*

Example 8.—A banker is asked by a customer to sell him Fcs. 100,000 three months' forward. What rate will he quote and what profit will he make (ignoring expenses) if the rates at which he is able to deal are Fcs. 80·15–·20 for spot and 10–15 c. discount for 3 months? Allow the banker 5 c. in the rate for his profit.

Solution :—

Market selling rate for spot	80·15
Less Banker's profit 5 c.	·05
	80·10
Add Discount on swap	·10
Rate quoted to customer	Fcs. 80·20

	£	s.	d.
Banker sells Fcs. 100,000 @ 80·20 to customer, realising ..	1,246	17	8
He buys spot from the Market at 80·15	1,247	13	3
These two operations show a loss of		15	7

He sells spot against forward, at a discount of 10 c. in his favour.

		£	s.	d.
Proceeds of spot	$= £\frac{100,000}{80·20}$	1,246	17	8
Cost of forward	$= £\frac{100,000}{80·30}$	1,245	6	8
Profit on swap		£1	11	0

Net profit on the transaction = £1 11s. 0d. — 15s. 8d. = 15s. 4d.

(*Note.*—In the second part of the transaction it is not certain that the banker will effect the swap on the basis of the same spot rates as are quoted in the question. By the time he comes to effect the swap the spot rates may have moved considerably, but so long as the swap margin remains unaltered, the actual cost or profit arising from the swap will be approximately the same.

Thus, if the spot rates had moved to 80·45–·50, and the swap margin was still 10–15 c. discount, the calculations would be:—

		£	s.	d.
Proceeds of spot	$= £\frac{100,000}{80·50}$	1,242	4	8
Cost of forward	$= £\frac{100,000}{80·60}$	1,240	13	11
Profit on swap		£1	10	9

Alternatively, if the spot rates had moved to 70·95–80·00, and the swap margin was still 10–15 c. discount, the calculations would be:—

		£	s.	d.
Proceeds of spot	$= £\frac{100,000}{80·00}$	1,250	0	0
Cost of forward	$= £\frac{100,000}{80·10}$	1,248	8	10
Profit on swap		£1	11	2

It will be seen that, though there is quite a wide movement in the spot rates, the profit on the swap is scarcely affected. This illustrates why it is that the banker protects himself by covering in the spot market, and carrying out the swap at his leisure—see Chapter XI.)

Example 9.—A customer offers a London dealer 50,000 lire three months' forward. Calculate the rate which the dealer will apply, if the market spot rate is 92·78–·83, and forward lire are quoted 15–10 c. per month under spot. Allow 5 centesimi in the rate for dealer's profit, brokerage, and other expenses.

Solution :—

Market buying rate for spot	92·83 lire.
Less 3 months' premium @ 10 c. per month	·30
	92·53
Add Allowance for profit, etc.	·05
Dealer's rate for 3 months' forward	92·58 lire per £1.

Example 10.—If the T.T. rate London on New York is quoted on 30th September at \$3·64–¼ per £1, whilst the forward margins are: one month, ¾–½ c. premium; two months, 1½–1¼ c. premium; and three months, 2¼–2 c. premium, and a London banker is prepared to deal at these rates, what rates will he quote to a customer: (1) for the sale; (2) for the purchase of:—

(*a*) \$10,000 for delivery 31st October;
(*b*) ,, ,, ,, during October at his option;
(*c*) ,, ,, ,, 30th November;
(*d*) ,, ,, ,, during November at his option;
(*e*) ,, ,, ,, during October/November at his option;
(*f*) ,, ,, ,, 31st December;
(*g*) ,, ,, ,, during December at his option;
(*h*) ,, ,, ,, during November/December at his option;
(*i*) ,, ,, ,, during October–December at his option?

Solution :—

Banker's Rates.	Selling.	Buying.
T.T.	3·64	3·64¼
1 month forward ..	3·63¼	3·63¾
2 months' forward ..	3·62½	3·63
3 months' forward ..	3·61¾	3·62¼

From these the following rates can be quoted:—

	Selling.	Buying.
(*a*)	3·63¼	3·63¾
(*b*)	3·63¼	3·64¼
(*c*)	3·62½	3·63
(*d*)	3·62½	3·63¾
(*e*)	3·62½	3·64¼
(*f*)	3·61¾	3·62¼
(*g*)	3·61¾	3·63
(*h*)	3·61¾	3·63¾
(*i*)	3·61¾	3·64¼

Example 11.—Using the figures in the preceding example and assuming that the customer enters into a contract: (*a*) for the purchase of \$10,000 from the bank; (*b*) for the sale of \$10,000 to the bank; for delivery at his option at any time during 1st October to 31st December, at what date must he deliver or take delivery of the currency if he is to take full advantage of his option?

Solution :—

(*a*) Purchase of $10,000 by the customer:—
Since dollars for forward delivery become *dearer* as the option is running, the customer is paying for them at the dearest rate, namely, for 31st December. He should therefore take delivery on 31st December.

(*b*) Sale of $10,000 by the customer:—
In this case he is having to deliver dollars to the bank, in effect, at the T.T. rate, *i.e.*, at the rate least favourable to himself.
To take full advantage of his option, therefore, he will deliver the dollars on 1st October.

Example 12.—The Market T.T. rate London on Paris on 30th June is $86\frac{5}{8}$–$\frac{3}{4}$ francs per £1, whilst the forward margins are: one month, $\frac{1}{8}$–$\frac{3}{16}$ discount; two months, $\frac{1}{4}$–$\frac{5}{16}$ discount; and three months, $\frac{3}{8}$–$\frac{7}{16}$ discount. A London banker is prepared to deal on the basis of these rates, allowing for his commission of $\frac{1}{8}$ franc.

(1) What rates will he quote for selling francs for delivery: (*a*) 31st July fixed; (*b*) 31st August fixed; (*c*) buyer's option over two months; (*d*) buyer's option over three months?
(2) What will be his *buying* rate for delivery: (*a*) seller's option over one month; (*b*) 30th September fixed; (*c*) seller's option 31st August–30th September?

Solution :—

Banker's Rates.	Selling.	Buying.
T.T.	$86\frac{1}{2}$	$86\frac{7}{8}$
1 month forward	$86\frac{5}{8}$	$87\frac{1}{16}$
2 months' forward	$86\frac{3}{4}$	$87\frac{3}{16}$
3 months' forward	$86\frac{7}{8}$	$87\frac{5}{16}$

From these the following rates can be quoted:—

(1) Selling.		(2) Buying.	
(*a*)	$86\frac{5}{8}$	(*a*)	$87\frac{1}{16}$
(*b*)	$86\frac{3}{4}$	(*b*)	$87\frac{5}{16}$
(*c*)	$86\frac{1}{2}$	(*c*)	$87\frac{3}{16}$
(*d*)	$86\frac{1}{2}$		

Modification of Forward Contracts.—Although all forward contracts between bankers and their customers are made in express terms as to date, amount and form of delivery, it is not uncommon for the customer to ask later for some modification in the arrangements. Thus, he may ask the banker to allow an early delivery or a postponement of delivery, or he may wish to tender the currency in the form of a cheque or notes when he had agreed to deliver T.T. In each of these cases the banker has the right to refuse to modify the terms; but usually he will agree to do so if it can be arranged without loss to him.

Generally there are two alternatives: either he modifies the rate at which payment is to be effected, or else he closes off the existing contract at current rates, and makes a new contract based on current conditions.

Example 13.—A customer has agreed to sell Fls. 10,000 for delivery May 31st at 8·12¼. On 1st May he asks for delivery to be postponed until June 30th. How can the banker arrange this transaction if his current dealing prices are spot, 8·07–·07½, and forward, 4–5 c. discount per month?

Solution :—

(1) The banker can " buy in " Fls. 10,000 against the customer for delivery on May 31st, charging his own selling rate of Fls. 8·07 plus 4 c. = Fls. 8·11.

Under the old contract the customer was due to deliver	£ s. d.
Fls. 10,000 and to receive £$\frac{10,000}{8·1225}$ on May 31st .. .. =	1,231 2 11
The contract is closed or " *compensated* " at Fls. 8·11, under which customer must pay £$\frac{10,000}{8·11}$	1,233 0 11
Amount due from customer to clear contract at maturity ..	£1 18 0

The banker now makes a *new* contract to take delivery of Fls. 10,000 on 30th June, i.e., 2 months forward. For this he quotes Fls. 8·07½ plus (5 × 2) c. = Fls. 8·17½.

Under the new contract the customer will receive	£ s. d.
£$\frac{10,000}{8·175}$ =	1,223 4 10
Less amount due from customer under old contract	1 18 0
Amount due to customer on June 30th =	£1,221 6 10

(2) Instead of closing out the old contract, the banker may agree to continue the old contract, *altering the rate to allow for the further month*. The old rate was Fls. 8·12¼, but the banker will adjust this to allow for the difference between his present buying rate for two months forward and his selling rate for one month forward (Fls. 8·175 less 8·11 = ·065).

He will therefore adjust the rate to

Fls. 8·12¼ plus ·06½ = Fls. 8·18¾

∴ Amount due to customer on June 30th = £$\frac{10,000}{8·1875}$

= £1,221 7s. 6d.

It will be seen that there is very little difference between the final amounts involved in the two methods. But this is because there had not been a wide movement in rates. If a wide movement occurs, the banker will almost invariably use the first method, which he is fully entitled to enforce.

When a customer has agreed to *buy* forward, and later wishes the contract postponed, the banker will sell out against him at the current rate, and make the new contract at the rate applicable to the new date of delivery.

Early delivery is treated on similar lines. If the customer has agreed to sell forward, and tenders his currency earlier than the contract date, the banker may either adjust the rate according to current con-

ditions, or, more probably, will buy the currency at his spot rate and sell forward to his customer the amount necessary to close off the contract.

On the other hand, if the customer has agreed to buy forward, and asks for early delivery, the banker may adjust his rate, or alternatively, he may sell the currency to his customer at his spot rate and buy forward from his customer the amount due under the contract.

Example 14.—A customer has agreed to sell cheque for Belgian francs 50,000 for delivery on 30th June at Belgas 23·30. On 1st May he tenders a cheque for the amount and asks the banker to close off the contract. Calculate the amount due to the customer if the banker's dealing rates on May 1st are Belgas 23·10–·15 for spot and Belgas ·15–·10 premium per month.

Solution :—

Belgian francs 50,000 is equivalent to Belgas 10,000.

	£ s. d.
Amount due to customer on June 30th $= £\frac{10,000}{23·30}$	= 429 3 8
This is closed off by banker selling him the amount, 2 months forward, at Belgas 22·80 $= £\frac{10,000}{22·8}$	= 438 12 0
Due from customer	£9 8 4
	£ s. d.
Proceeds of cheque $£\frac{10,000}{23·15}$	= 431 19 3
Less amount due on compensation of forward contract	9 8 4
Net amount due to customer	£422 10 11

Example 15.—A customer has agreed to buy Sw. Fcs. 50,000 at 16·95 for delivery on 31st March. On 1st March he asks to have the currency delivered at once. If the banker is then a dealer in spot at Fcs. 16·85–·90 and is willing to settle the bargain on the basis that his 1 month forward rate is 5 c. discount, calculate the amount payable by the customer.

Solution :—

Under existing contract customer should pay $£\frac{50,000}{16·95}$ on March 31st.

But banker compensates this contract by buying the francs back from him at his buying rate for 1 month forward, viz.

Fcs. 16·90 + ·05 = 16·95.

Since this is the same rate as was fixed under the contract, there is no difference to pay or receive.

Cost of Fcs. 50,000 (spot) at Fcs. 16·85 $= £\frac{50,000}{16·85}$	
Amount due from customer	£2,967 7s. 2d.

The problem is a little more difficult when the customer has an option, as will be seen in the next example.

Example 16.—A banker has sold to his customer Pes. 100,000 at 35·30 for delivery at customer's option during May. On April 1st the customer asks for immediate delivery. What amount will he have to pay if the banker is then a dealer in spot at 35·50--·60 and in forward at 10–15 c. discount per month?

Solution :—

	£ s. d.
The customer is due to pay (during May) $£\frac{100,000}{35·30}$	= 2,832 17 3
But the banker will compensate this contract by buying the currency back from him for delivery during May—again at customer's option. The buying rate for May 1st (1 month forward) is 35·75, and for May 31st (2 months forward) is 35·90; *the customer is entitled to expect the better of these rates*, since the option is in *his* favour. Hence the banker will apply the lower rate, 35·75.	
Hence, contract is compensated at 35·75	= 2,797 4 0
Due from customer	£35 13 3

	£ s. d.
Cost of Pes. 100,000 (spot) at 35·50	= 2,816 18 0
Add Difference above	35 13 3
Net amount due	£2,852 11 3

Example 17.—*Early delivery under Forward Contract.*

You purchase from a customer $10,000 cheque New York for delivery three months forward @ $3·45\frac{1}{2}$. One month after arrangement of this contract your customer delivers a cheque for $5,000 and asks you to compensate the balance. You are then a dealer in dollar cheque @ $3·50\frac{1}{4}$–$\frac{3}{4}$ and two months forward @ 1 c.–$1\frac{1}{4}$ c. discount. You accordingly take the cheque from him at the contract rate less an allowance of 1 c. in the rate for early delivery, and sell him $5,000 two months forward to compensate the undelivered portion. He asks you to discount his profit on the compensated part of the contract, and this you agree to do at 5 % p.a. Find the sterling amount with which you have to credit your customer.

Solution :—

	£ s. d.
Your customer has contracted to deliver to you $5,000 @ $3·45\frac{1}{2}$	1,447 3 6
You compensate this by selling him $5,000 2 months' forward at $3·51\frac{1}{4}$..	1,423 9 9
∴ Customer's profit	£23 13 9
Less Discount @ 5 % p.a...	3 11
	£23 9 10
Add Amount due to customer for $5,000 @ $3·44\frac{1}{2}$ ..	1,451 7 7
	£1,474 17 5

∴ Total amount due to customer = £1,474 17*s.* 5*d.*

Example 18.—*Extension of Forward Purchase from Customer.*

A merchant contracts with his banker to sell the latter Rm. 10,000 for delivery 1st January at 14·20. Just before this date he delivers to the banker a draft on Berlin for Rm. 3,290·60, and asks for the balance of the contract to be extended until 1st March, which the banker agrees to do at 5 pfennige " in my favour ".

Find (*a*) the amount credited to the customer in exchange for his draft, allowing the banker 2s. 6d. % as collecting commission.

(*b*) The amount to be credited to the customer upon delivery of the balance on 1st March.

Solution :—

	£	s.	d.
(*a*) Equivalent of Rm. 3,290·60 @ 14·20	231	14	8
Less Collecting Commission @ $\frac{1}{8}$ %		5	9
∴ Amount to be credited to customer immediately	£231	8	11
(*b*) Equivalent of Rm. 6,709·40 @ 14·25	470	16	8
∴ Amount to be credited to customer on 1st March	£470	16	8

Example 19.—On 29th March, 1933, a London exchange operator is asked by a customer to quote for the sale to the latter of Fcs. 100,000 T.T. Paris for delivery at the customer's option during May and June, 1933. The London market rates are:—

Spot T.T. (for 31st March)	$83\frac{1}{2}$–$\frac{5}{8}$
T.T. 1 month forward	$\frac{1}{2}$–1 franc discount
T.T. 2 months' forward	1 –$1\frac{1}{2}$,,
T.T. 3 months' forward	$1\frac{1}{2}$–2 ,,

Assuming that the London operator can deal in the market at these rates and requires $\frac{1}{4}$ franc profit on the deal, what rate should he quote to the customer?

The customer accepts the rate, but on 29th May, 1933, he informs the dealer that he will not require the francs and asks for them to be bought back from him as on 31st May, 1933. If the London market rates are then:—

Spot T.T. (for 31st May)	$85\frac{1}{8}$–$\frac{1}{4}$
T.T. 1 month forward	$\frac{1}{2}$ franc premium–par
T.T. 2 months' forward	1–$\frac{1}{2}$ franc premium
T.T. 3 months' forward	$1\frac{1}{2}$–1 ,,

and the dealer again requires $\frac{1}{4}$ franc profit, what will be the sterling amount due to or by the customer in respect of the whole transaction?

(Neglect charges and expenses throughout.) (*Institute of Bankers*, 1934.)

Solution :—

The customer's option extends from 1st May to 30th June.

Hence the banker will quote the worst of the rates for one and three months' forward, respectively.

His rate for selling 1 month forward is $83\frac{1}{2} + \frac{1}{2} - \frac{1}{4} = 83\frac{3}{4}$ francs

His rate for selling 3 months' forward is $83\frac{1}{2} + 1\frac{1}{2} - \frac{1}{4} = 84\frac{3}{4}$ francs

	£	s.	d.
∴ He will quote $83\frac{3}{4}$ fcs. per £1.			
∴ Amount due from customer is £$\frac{100{,}000}{83\cdot75}$ .. .. .. =	1,194	0	7
On 29th May, the banker buys back the francs, for delivery 31st May, at his buying rate for spot francs, *i.e.*, $85\frac{1}{2}$			
∴ Amount due to customer is £$\frac{100{,}000}{85\cdot5}$ .. .. =	1,169	11	10
Sterling amount due by the customer	£24	8	9

Bad Tender.—Most forward contracts are for T.T., though occasionally they are entered into for delivery of the currency by cheque. Whichever is agreed, the banker is entitled to demand tender in the form agreed upon. If the customer has agreed to deliver T.T., but tenders a cheque, the banker is entitled to refuse it, but usually if the amount is not too large (or the mailing period too long) he will merely charge a collection commission (as in Example 18 above). But if the centre is at some distance (e.g., New York) or the forward currency is at a heavy discount, the banker is entitled to send the cheque for collection and treat the delivery as having been *postponed* until the date when the proceeds are credited to him. Alternatively, he could adjust the rate to that which he would have quoted for cheque delivery, i.e., by adding the cheque margin.

If a customer tenders foreign *notes*, when the agreement is for cheque or for T.T., the banker may adjust the rate to allow for insurance and other expenses on the notes. But if the notes cannot be remitted abroad, owing to exchange restrictions, the banker will have to sell them for what they will fetch and buy in the cheque or T.T. against the customer, debiting him with the difference.

Example 20.—A customer agrees to deliver Swedish Kr. 5,000 by cheque, at 18·75, on January 31st. On that date he tenders Kr. 1,000 in bank notes and asks the banker to " close out " the remainder of the contract. Assuming that the banker is willing to take the notes at a discount of 50 öre on his cheque rate and that he is willing to deal in cheque Stockholm at Kr. 19·10–·15, calculate the amount due to or from the customer.

Solution :—

Kr. 1,000 of contract is settled by tender of bank notes, which banker takes at discount of 50 öre on the contract rate, viz., 19·25, realising £51 18 11

	£ s. d.
Amount due to customer under balance of contract $= £\frac{4,000}{18·75}$	= 213 6 8
This is compensated at Kr. 19·10, viz., $\frac{£4,000}{19·1}$	= 209 8 6
Due to customer	£3 18 2

Net amount payable to customer = £51 18s. 11d. plus £3 18s. 2d.
= £55 17s. 1d.

Example 21.—You are dealing in T.T. Kobe at $1/4\frac{1}{16}-\frac{3}{32}$, and in the forward at $\frac{1}{32}$ discount per month. A customer who is expecting to receive yen from an importer abroad asks you to quote for one, two, and three months' options.

(*a*) What rates will you quote him?
(*b*) Assuming he accepts the one month option, buy from him Yen 64,071·30.
(*c*) If he subsequently asks you to accept cheque in lieu of T.T., adjust your rate to allow for 35 days' mail, reckoning interest at 6 % p.a.

Solution :—

(*a*) The following rates would be quoted:—

1 month's option	1/4 3/32d.
2 months' option	1/4d.
3 months' option	1/3 31/32d.

(*b*) Yen 64,071·30 at 1/4 3/32d.

By practice:—

64,071·30 @ 1/–	£3,203·565
64,071·30 @ 4d.	1,067·855
64,071·30 @ 3/32d.	8·343
	£4,279·763

Amount due from customer = £4,279 15s. 3d.

(*c*) If the customer tenders a cheque in place of a T.T. the rate will be adjusted as follows:—

T.T. rate	16·03125d.
Deduct Interest, 6 % for 35 days ..	·09223
	15·93902d.

∴ Rate is 1/3 31/32d. per yen.

Example 22.—On 28th November the following rates ruled in the London Market:—

London on New York, T.T. for 30th November ..	5·20½–21
1 month forward margin	4½–5 c. discount
2 months' forward margin	7–7½ c. discount
3 months' forward margin	9½–10 c. discount

A London banker is asked to sell a customer $17,500 for delivery at the option of the customer during the month of January, 1934. He makes the sale at the appropriate market rates, with an allowance of ½ c. for his profit and covers his risk by buying in the dollars for 31st January fixed, again at the market price. The customer requests delivery of the dollars on 2nd January. The banker complies and has to buy spot for that date against selling 31st January, when the market rates are, T.T., 5·36–·36½, spot (for 2nd January) against end January, 3½–4 c. discount. What eventual profit or loss does the banker make on the transaction, neglecting all charges and expenses? (*Institute of Bankers*, 1934.)

Solution :—

Banker's selling rates:—

Spot	5·20½ − ½ = 5·20
1 month forward	5·20½ + 4½ − ½ = 5·24½
2 months' forward	5·20½ + 7 − ½ = 5·27
∴ Option over second month	5·24½

	£	s.	d.
Cost of dollars to the customer = £17,500/5·245 ..	= 3,336	10	3

Banker covers by buying spot at 5·205, and swaps the spot for forward at a difference of 7 c. in his favour. Hence, the rate at which he obtains his forward cover is 5·205 + ·07 = 5·275.

Costing £17,500/5·275	= 3,317	10	9
Profit	£18	19	6

On 2nd January the banker effects a swap, buying spot and selling forward.

	£	s.	d.
Banker buys spot on 2nd January @, say, 5·36			
$17,500 @ 5·36	3,264	18	6
He sells forward for delivery 31st January, at a difference of 4 c. against him, say, 5·40, realising	3,240	4	9
Loss	24	3	9
Deduct Profit	18	19	6
Net Loss	£5	4	3

Investment Operations with Forward Exchange Secured.—The following are typical examples of modern investment operations, protected by forward deals, undertaken by bankers with the object of taking advantage of differences in the rates of interest ruling in various financial centres at the same time. The examples are self-explanatory, and it will be seen that they may be of almost infinite variety.

It will be noticed that in many of the following transactions the banker is able to make a profit by taking advantage of a disparity between forward margins and differences in interest rates. This proves conclusively that interest rates are not the *sole* determinant of forward margins (see Chapter XI, *ante*).

Example 23.—*Investment in Kobe with Forward Exchange Guaranteed.*

The rate of interest in Kobe being 6¼ % per annum, a London banker wires his agent in the former centre to sell T.T. £50,000 on London at 21¾d. per yen, placing the proceeds on fixed deposit in Kobe for 90 days. In London the anticipated total is sold 90 days forward at 21 3/16d. If the London interest rate is 5 %, show the net resulting profit.

Solution :—

£50,000 T.T. on London sold in Kobe @ 21¾ produces ..	Yen	551,724·14	
Int. thereon for 90 days @ 6¼ % p.a.		8,502·6	
Total	Yen	560,226·74	
This total sold forward in London @ 21 3/16d. yields *at maturity*	£50,916	8	10
Deduct £50,000 *plus* 90 days' interest at 5 % p.a.	50,616	8	9
Net resulting profit	£300	0	1

Example 24.—*U.S. Dollar Deposit Invested in London with Forward Exchange Secured.*

A London banker is offered a U.S. dollar deposit fixed for three months at 3½ % p.a., the forward rate on New York being 1–¾ c. premium, three months; spot rates 4·85¾—·86. Determine the rate at which sterling must be usable in London to make the deal profitable, and find the approximate net profit if the amount is $486,000 and the three months' Treasury bill rate is 4½ % p.a.

Solution :—

Dollars can be *sold* spot in London at \$4·86 and bought 3 months' forward at \$4·85, i.e., the banker can effect a swap at a difference of 1 c. against him.

∴ On \$4·86 the loss for 3 months is \$·01

∴ On \$100 the loss for 1 year is $\frac{\$·01 \times 100 \times 4}{4·86}$

$= ·825\ \%$ p.a. (approx.).

If the deal is to be profitable, sterling must be usable in London at a margin over :—

$3\frac{1}{2}\ \% + ·825\ \% = 4·325\ \%$ (approx.).

If, therefore, three months' Treasury or bank bills in London yield from $4\frac{3}{8}$ to $4\frac{1}{2}\ \%$ p.a., the offer of the dollar deposit would be acceptable.

Illustration.

		£	s.
\$486,000 T.T. on New York sold in London at 4·86 yields ..		100,000	0
This sum, invested in 3 months' Treasury bills at $4\frac{1}{2}\ \%$ p.a., yields		1,137	16
Total		£101,137	16
Amount of deposit	\$486,000		
$3\frac{1}{2}\ \%$ for 3 months	4,252·5		
	\$490,252·5		
This amount bought forward at 4·85 costs at maturity ..		101,083	0
Giving a profit, excluding expenses, of		£54	16

NOTE.—The yield on the Treasury bills is calculated as follows:—

3 months' discount @ $4\frac{1}{2}\ \%$ p.a. $= 1\frac{1}{8}\ \%$.

∴ A bill for £100 due in 3 months costs $£98\frac{7}{8}$.

∴ £100,000 will purchase bills for $£\frac{100{,}000 \times 100}{98\frac{7}{8}} =$ £101,137 16*s*.

In this illustration it is assumed that the banker buys forward the principal amount of dollars *together with interest*. In practice, of course, he would effect a swap, buying forward the same amount as he sells spot, i.e., \$486,000. For purposes of convenience in this and the following examples, however, the less *practical* method of including interest is adopted.

Example 25.—*Investment of New York Funds in London.*

A New York dealer can obtain $3\frac{5}{8}\ \%$ p.a. on 3 months' deposits, while in London 3 months' bank bills can be bought at $4\frac{1}{2}\ \%$ p.a. If exchange rates are T.T. $4·85\frac{5}{16}$–$·86\frac{1}{16}$ and 3 months' forward $\frac{7}{8}$–$\frac{3}{4}$ c. premium, and the dealer can do business at the middle rates for spot and forward, what is the gain or loss per cent p.a. by undertaking a swap and deposit, and investing the sterling in bills, brokerage $\frac{1}{64}$ c.? Calculate the outturn of an investment of \$486,000.

Approximate Solution :—

Difference in interest rates * $= 4\frac{1}{2} - 3\frac{5}{8}\ \% = \frac{7}{8}\ \%$ per annum.

$= \frac{7}{32}\ \%$ per quarter.

$\frac{7}{32}\ \%$ in \$ rate at 4·86 $= ·01063$ \$.

$= 1\frac{1}{16}$ c. in the rate.

* See Note over.

∴ Selling dollars spot and buying 3 months' forward at $\frac{13}{16}$ c. *against the dealer* (middle rate) leaves a margin of $1\frac{1}{16}$ c.$-\frac{13}{16}$ c.$-\frac{1}{64}$ c. (brokerage) = $\frac{15}{64}$ c. in the rate, or

$$\frac{15}{64} \times \frac{1}{4 \cdot 86} \text{ \% per 3 months}$$

$= \frac{3}{64}$ % per 3 months (approx.) = $\frac{3}{16}$ % per annum.

If the forward dollar rate goes to a higher premium the operation becomes too fine to show a reasonable profit.

* NOTE.—If London bills can be bought at $4\frac{1}{2}$ % p.a., the *actual yield* is calculated thus:—

$4\frac{1}{2}$ % p.a. for 3 months = $1\frac{1}{8}$ %.
∴ £100 bill costs $98\frac{7}{8}$.
∴ £$98\frac{7}{8}$ yields £100 in 3 months

$$\text{equivalent to } \frac{1\frac{1}{8}}{98\frac{7}{8}} \times \frac{100}{1} \times \frac{4}{1} \text{ \% per annum}$$

= 4·5512 % p.a., i.e., slightly more than $4\frac{1}{2}$ % p.a.

For most estimates of yields it is sufficient to take the rate of discount, but where an *exact* result is required, the *true* yield must be taken.

Illustration :—

	£	s.	d.
$486,000 T.T. on New York sold in London at 4·86 spot yields	100,000	0	0
This sum invested in 3 months' bank bills at $4\frac{1}{2}$ % p.a. yields $\frac{£10,000 \times 4 \cdot 5512}{4 \times 100}$	1,137	16	0
Total	£101,137	16	0

3 months forward rate, less brokerage,

= \$4·86 — $\frac{13}{16}$ c. — $\frac{1}{64}$ c. = \$4·85$\frac{14}{64}$.

£101,137 16s. sold forward at \$4·85$\frac{14}{64}$ yields		\$490,692·16
Original deposit	\$486,000	
In New York this would yield 3 months @ $3\frac{5}{8}$ %	4,405	
		490,405
Profit		\$287·16

or approximately $\frac{15}{64}$ % p.a.

Example 26.—A London banker purchases a T.T. for 1,000,000 reichsmarks when the market rates are 20·51–$\frac{1}{2}$, and places the funds on fixed deposit in Berlin for a period of three months at a rate of $7\frac{1}{2}$ % p.a. At the same time he sells forward the amount of the deposit plus the interest, the market forward rates being $1\frac{3}{4}$–$2\frac{1}{4}$ pfennige discount for three months. Calculate (*a*) the original cost of the deposit, and (*b*) the amount realised by the proceeds at maturity.

Solution :—

(*a*) Cost of 1,000,000 reichsmarks at 20·51.

$$= £\frac{100,000}{20 \cdot 51}$$
$$= £48,756 \cdot 704$$
$$= £48,756 \text{ 14s. 1d.}$$

(*b*) **Amount realised by proceeds at maturity.**

$$= \text{Rm. } 1{,}000{,}000 + \frac{1{,}000{,}000 \times 15}{800}$$

$$= \text{Rm. } 1{,}018{,}750$$

Assuming the banker effects a swap, these proceeds are sold forward at a difference of $2\frac{1}{4}$ pf. against him, say at $20 \cdot 53\frac{1}{4}$.

$$\therefore \text{ Sterling} = £\frac{1{,}018{,}750}{20 \cdot 5325}$$

$$= £49{,}616 \cdot 462$$

$$= £49{,}616\ 9s.\ 3d.$$

Example 27.—An exchange operator in London can borrow U.S. dollars at $2\frac{1}{2}$ % p.a., and can lend sterling at 3 % p.a. If the T.T. rate, London on New York, is quoted in the Market as $\$4 \cdot 85\frac{7}{8}$–$\cdot 86$ per £1 and the three months' (or 93 days') forward margin is $\frac{1}{4}$ c. premium, find the profit or loss, neglecting expenses, on borrowing $500,000, and lending the sterling equivalent for 93 days. (New York allows 360 and London 365 days to the year.)

Solution :—

The operator will sell the $500,000 in the form of a T.T. on New York at the rate of $4·86 per £1, giving a net yield of $£\frac{500{,}000}{4 \cdot 86} = £102{,}880 \cdot 659$

On this he will receive interest at 3 % p.a. for

$$93 \text{ days} = \frac{102{,}880 \cdot 659 \times 3 \times 93}{365 \times 100} = 786 \cdot 403$$

	£	s.	d.
∴ Total proceeds of loan in London .. £103,667·062	103,667	1	3

In New York he has to pay interest at $2\frac{1}{2}$ %

$$\text{p.a. on } \$500{,}000 = \$\frac{500{,}000 \times 5 \times 93}{360 \times 100 \times 2} = \$3{,}229 \cdot 17$$

∴ He must buy forward $503,229·17, and, assuming he effects a swap, the rate will be $\frac{1}{4}$ c. against him, viz., $4 \cdot 85\frac{3}{4}$, costing

$$£\frac{503{,}229 \cdot 17}{4.8575} = £103{,}598 \cdot 388 = 103{,}598\ 7\ 9$$

∴ His profit on the deal £68 13 6

Example 28.—An exchange operator can borrow sterling at 4 % p.a., and can lend francs at $5\frac{1}{4}$ % p.a. If the market rates for T.T., London on Paris, are 123·95–124·00 francs per £1, and the three months' forward margin in London is 20 c.–15 c. premium, find the profit or loss, neglecting expenses, on borrowing £100,000, and lending the franc equivalent for three months.

Solution :—

The operator has to borrow sterling, buy spot francs and lend them, and secure the exchange risk by selling the proceeds forward:—

Amount of francs obtainable for £100,000 at 123·95 ..	Fcs. 12,395,000
This earns interest for 3 months at $5\frac{1}{4}$ % p.a.	162,684·375
∴ Total proceeds in 3 months	Fcs. 12,557,684·375

Assuming that the spot purchase and the forward sale are combined in a swap, the forward rate will be 15 c. in favour of the operator, viz., 123·80.

Value of francs 12,557,684·375 at forward rate of 123·80

$$= £\frac{12,557,684 \cdot 375}{123 \cdot 8}$$

	£	s.	d.
= £101,435·253 =	£101,435	5	1
Out of this the dealer will have to repay £100,000 *plus* interest at 4 % for 3 months (£1,000) totalling	£101,000	0	0
∴ The dealer makes a profit on the deal of	£435	5	1

Example 29.—*Investment in Indian Treasury Bills with Forward Exchange Secured.*

Calculate the net yield per cent. per annum from the following investment in Indian Government Treasury bills. You buy six months' Treasury bills with a face value of 7 lacs at an issue price of 98. You buy the spot rupees at 1/6¼d. and re-sell the proceeds of the bills six months' forward at 1/6$\frac{7}{32}$d. Brokerage is $\frac{1}{32}$ % p.a. on the sterling cost of the bills. Cable expenses amount to £5.

Solution :—

	£	s.	d.
The bills cost $\frac{700,000 \times 98 \times 18\frac{1}{4}}{100 \times 240}$ .. .. .. =	52,164	11	8
Brokerage @ $\frac{1}{64}$ %	8	3	0
Cable expenses	5	0	0
	£52,177	14	8
The sterling yield at maturity is £$\frac{700,000 \times 18\frac{7}{32}}{240}$ .. =	53,138	0	5
Profit	£960	5	9

$$\text{Therefore the yield per cent per annum} = \frac{960 \cdot 2875 \times 12 \times 100}{6 \times 52,177 \cdot 7333}$$

$$= \underline{3 \cdot 6808\ \%}$$

Example 30.—*Investment in British Treasury Bills with Forward Exchange Secured.*

A New York banker buys sterling in New York for investment in Treasury bills in London. He covers his purchase by a sale of sterling three months' forward. He deals at a spot rate of $3·30 and at a forward rate of $\frac{3}{16}$ c. premium. His London agent misses the Treasury bills by tender and is obliged to purchase them in the Discount Market at a brokerage (i.e., $\frac{1}{32}$ %) below $\frac{1}{16}$ %. What return (calculated to the nearest $\frac{1}{32}$ % p.a.) will the New York banker obtain from thus employing his funds?

Solution :—

Profit on re-exchange = $\frac{3}{16}$ c. = $·001875 for 3 months = $·0075 p.a.
Yield p.a. on $3·3 = $·0075.

$$\therefore \text{Yield per cent. p.a.} = \$\frac{\cdot 75}{3 \cdot 3} = \$ \cdot 227 = \text{(say)}\ \tfrac{7}{32}\ \%.$$

Yield per cent. p.a. on Treasury bills = $\frac{21}{32}$ % (approx.).*
Total yield = $\frac{7}{32} + \frac{21}{32}$ % p.a.
∴ Total yield per cent. p.a. (to nearest $\frac{1}{32}$ % p.a.) = $\frac{7}{8}$.

* See note on page 724 *re* calculation of true yield.

Example 31.—*Borrowing Sterling by Selling Cheque on New York and Covering by Forward T.T.*

Over the turn of the half-year ending 30th June, 19.., 7-day money in London was worth 5 %, while New York T.T. rate was 4·86–·86$\frac{1}{16}$, whilst the margin for selling cheque on New York was $\frac{1}{4}$ c. *over* T.T. The American mail left London on 26th June for delivery in New York on 2nd July. If a London dealer wished to borrow sterling over the turn of the half-year, would it have been cheaper to borrow money in the London Market or to sell cheque in New York (for which he receives sterling at once), covering by an outright forward T.T. purchase, valeur compensée 2nd July, the rate at which he can effect the short forward purchase for this date being 4·85$\frac{15}{16}$.

Solution :—

Dealer *sells* cheque at 4·86$\frac{5}{16}$ and *buys* 2nd July at 4·85$\frac{15}{16}$, a total charge of $\frac{3}{8}$ c. *in the rate.*

Money in London is worth 5 % per annum

6 days at 5 % p.a. is approx. $\frac{1}{12}$ of 1 %.

$\frac{1}{12}$ % of \$4·85$\frac{15}{16}$ = \$·00405

= $\frac{13}{32}$ c. (approx.) in the rate.

Therefore the dealer can save $\frac{13}{32}$ c.–$\frac{3}{8}$ c.

= $\frac{1}{32}$ c. per £ by selling cheque and buying forward T.T.

Example 32.—*Investment in Vienna Bills with Forward Exchange Secured.*

The following is an actual example of an investment operation made from London.

£50,000 T.T. on London was sold in Vienna @ 34·48, yielding			S. 1,724,000·00
Which was placed to the credit of Vienna *Nostro* Account			
Bills to the value of S. 1,700,000 having an average of 3 months to run were purchased at a discount of 10 %, plus $\frac{1}{18}$ % commission, and the schilling account was debited with their cost, viz.	S. 1,700,000		
Less total discount and commission ..	43,444·44		
			1,656,555·56
Balance		S.	67,444·44
This balance was placed on fixed deposit for 3 months at 10 % p.a. (free of all taxes) yielding			S. 1,686·11
The balance of the deposit, plus interest, viz., S. 69,130·55, and the face amount of the bills, S. 1,700,000, were sold forward 3 months at 34·76$\frac{4}{8}$, returning to London at maturity ..			£50,886 8 8

This shows a profit of £886 8s. 8d., or approximately 7 % per annum.

Example 33.—A London banker is prepared to deal in T.T. New York at \$4·84$\frac{3}{16}$–4·84$\frac{5}{16}$. He buys a parcel of 60 days' sight bills on New York for a total face value of \$153,479·50 and sells the proceeds forward at \$4·85$\frac{1}{16}$. Discount in New York is 3$\frac{3}{4}$ % p.a., and is calculated on a 360-day year.

Find (*a*) the banker's buying rate for the bills, to the nearest $\frac{1}{16}$ c.; (*b*) his outlay in sterling; and (*c*) the sterling equivalent of the proceeds at maturity. Allow 10 days for mailing period, but neglect other charges.

Solution :—

(*a*) T.T. rate (buying) = \$4·84 15/16	4·849375
Add Interest 70 days at 3¾ %	·03536
	4·884735

∴ Bankers' Buying Rate for 60 days' sight draft (to nearest 1/16 c.)
= \$4·88½ per £1.

(*b*) Cost of \$153,479·50 at 4·88½ = £31,418·526
= £31,418 10s. 6d.

(*c*) Forward rate, \$4·85 1/16 = \$4·850625
Value of \$153,479·50 at \$4·850625
= £31,641 3s. 7d.

Example 34.—If the brokers in London quote Zurich at either side of 17·90 and the three months' forward Swiss franc as ½–⅜ c. premium, find the yield to the nearest ⅛th % p.a. on a purchase of three months' Swiss bank acceptances at 2 13/16 % p.a. after securing the exchange by a swap undertaken in the London Market.

Solution :—

The banker will buy the bills at a long rate based on the spot rate of 17·90 and will cover this purchase by selling spot at 17·90. On these operations he will receive a net yield of 2 13/16 % p.a.

He has now to " swap " the spot sale for a forward sale, i.e., he sells forward against a purchase of spot, at a margin of ⅜ c. in his favour (since forward francs are at a premium).

This margin represents a percentage yield for one year of :—

$$\frac{12}{3} \times \frac{3}{8} \times \frac{1}{17{\cdot}90} \times \frac{100}{1}$$

= ·084 % p.a.
Add 2·8125 % p.a. (Yield on bills.)
Total Yield = 2·8965 % p.a.
Say, 2⅞ % p.a.

Example 35.—(*a*) The market in three months' Treasury bills is ⅝ %–11/16 %. Assuming that your bank can deal at these prices with the bill brokers, how would you sell £100,000 Treasury bills, taking 1/32 in the rate for yourself?

(*b*) If you sell the bills to an American banker at this price, what is his net yield if spot sterling is quoted at 4·49–·50, and three months' forward sterling in New York is 2–3 c. premium? He covers the exchange risk.

Solution :—

(*a*) The bank can buy Treasury bills at ⅝ % p.a. and will therefore be willing to sell at ⅝ minus 1/32 = 19/32 % p.a.

(*b*) The New York banker will effect a swap of spot sterling against the forward at 2 c. in his favour, viz., at 4·52 against 4·50.

If, therefore, the New York banker buys £100,000 Treasury bills, he will have to purchase sterling at 4·50.

The bills will therefore cost him	\$450,000
Less discount @ 19/32 % for 3 months	667·97
	\$449,332·03
He will sell £100,000 @ 4·52, realising	\$452,000·00
Showing a profit of	\$2,667·97

This represents a percentage yield per annum of:—

$$\frac{2{,}668}{449{,}333} \times \frac{4}{1} \times \frac{100}{1}$$
$$= 2{\cdot}375\ \%$$

Net Yield, say, $2\frac{3}{8}$ % p.a.

Example 36.—*Swap and Deposit in Yen.*

The following is an example of the rough and exact calculations of the yield from an investment in yen.

Rough Calculation.

At the time of writing, forward yen in London are at a premium of about $\frac{1}{4}$d. per three months, i.e., 1d. per year, which, on a basis of 1/9$\frac{3}{4}$d. per yen, gives a yield of

$$\frac{1 \times 100}{21{\cdot}75}\% = 4{\cdot}5977\ \%\ \text{p.a.}$$

Less brokerage, which on yen is $\frac{1}{32}$nd per cent.,
i.e., $\frac{1}{8}$ % p.a. .. .. ·125

4·4727 % p.a.

A swap and deposit operation in yen would therefore yield 4·4727 % even if the deposit in Japan received no interest. It would require an interest rate of only $1\frac{1}{2}$ % to bring the yield up to 5·9727 %, or nearly 6 %.

Exact Calculation.

Yen 500,000 sold forward, value 6th Sept., @ 1/10d. ..	£45,833	6	8
Yen 500,000 bought spot, value 6th June, @ 1/9$\frac{3}{4}$d. ..	45,312	10	0
	£520	16	8
Interest on Yen 500,000 from 6th June to 6th Sept. (92 days) at $1\frac{1}{2}$ % = Yen 1,890·41, which at 1/10d. (the forward rate)	£173	5	9
	£694	2	5
Less brokerage ($\frac{1}{32}$ % on £45,833 6s. 8d., the larger side of the swap*)	14	6	5
	£679	16	0

* NOTE.—Only one brokerage is usually charged on a swap.

Hence an investment of £45,312 10s. in Japan for 92 days at $1\frac{1}{2}$ % p.a. produces £679 16s., or 5·9521 %, subject to a small outlay on cables, the only other expense.

The first calculation is that which a busy dealer would make, the second being left to the instruction clerks. The slight discrepancy between the two rates calculated is due to the fact that the dealer calculates roughly that he will be out of his money for exactly a quarter of a year, whereas his investment actually lasts for 92 days, i.e., $\frac{92}{365}$ of a year.

NOTE.—In this example the interest has been sold separately. This is the practical method—see Note to Example 24.

Example 37.—*Arbitrage by "Swaps" of Spot and Forward Pesetas in two centres.*

London brokers quote Madrid one month forward at 3–5 premium. During a telephone call to Berlin, a London dealer induces a German operator to quote him the forward peseta on a sterling basis, and is given a quotation of 6–8 premium. He accordingly swaps pesetas 500,000 in Berlin at 6 centimos, and covers in London at the middle, i.e., 4 centimos. Calculate his profit on the operation if the London spot rate is 34·21.

Solution :—

In Berlin :—

500,000 pesetas bought spot at the equivalent of 34·21, cost	£14,615	12 2
500,000 pesetas sold one month forward at the equivalent of 34·15, yield	14,641	5 9
Banker's profit	£25	13 7

In London :—

500,000 pesetas sold spot at 34·21, yield	14,615	12 2
500,000 pesetas bought one month forward at 34·17, cost ..	14,632	14 4
Loss	£17	2 2

Gross Profit = £25 13s. 7d. less £17 2s. 2d.
= £8 11s. 5d.

Gross profit				£8	11 5
From this total, certain expenses would have to be deducted, viz. :—					
One "pay" and one "receive" cable (the forwards being settled by mail), say ..	£0	8	0		
Brokerage on London swap at 5/- per Ptas. 100,000	1	5	0		
Telephone call (assuming that the London dealer originated it and that no other business was done), say		10	0		
Special "overdraft commission" charged by Spanish banks where the payment is not covered a full day ahead ($\frac{1}{10}$th per mille on two payments of Ptas. 500,000 each) Ptas. 50·00, or roughly	1	9	3		
				3	12 3
Net profit				£4	19 2

A margin of two centimos between the forward swaps therefore gives a net profit of £4 19s. 2d. If, however, a margin of only one centimo were obtained, it is clear that the net profit would be only 13/6d. As even one centimo is hard to make nowadays, the difficulties of arbitrage under present conditions are obvious.

Example 38.—A London banker has an overdraft in New York amounting to $1,000,000. He knows that the overdraft will be cleared the following day, but in order to avoid paying 5% on his overdraft he carries out a "short swap" for the delivery of dollars "to-day against to-morrow" at a discount of $\frac{1}{64}$ c. per diem. If his London funds are worth 1% to him and brokerage is £1 10s. per $100,000, work out: (1) the total cost of the swap; and (2) the saving effected thereby. Assume that spot dollars are quoted at $4 = £1.

Solution :—

Cost of swap (he buys spot and sells forward)

$$= \frac{1}{64} \text{ c. per \$4 plus 30s. per £100,000}$$

$$= \frac{1}{64} \text{ c.} + \frac{(1{\cdot}5 \times 400 \times 4)}{100{,}000} \text{ c. per \$4}$$

$$= {\cdot}015625 \text{ c.} + {\cdot}024 \text{ c. per \$4}$$

$$= \underline{{\cdot}039625 \text{ c. in the rate.}}$$

The *actual cost* (on \$1,000,000) is $\$\frac{{\cdot}039625}{100} \times \frac{1{,}000{,}000}{4} = \$99{\cdot}0625$

Saving in interest is $\frac{1{,}000{,}000}{360} \times \frac{5}{100} = \underline{138{\cdot}8888}$

Net saving .. .. .. \$39·8263

	£	s.	d.
\$39·82 @ \$4 =	9	19	1
Deduct loss of interest at 1 % $= \frac{1}{100} \times \frac{1{,}000{,}000}{4} \times \frac{1}{365}$	6	17	0
Total saving	£3	2	1

Example 39.—A London banker sells \$40,000 to a customer for delivery in three months' time. His selling rate is based on the London Market rates of \$3·76⅛–¼ for T.T. and ½–¼ c. premium for three months' delivery, with an allowance of ⅛ c. for his profit. He covers himself by buying the dollars in Paris, for the same forward date, at an " outright " rate of Fcs. 25·53 per \$, and subsequently buys the necessary francs in the London market when the ruling rates are Fcs. 96⅝–⅞ for T.T. and Fcs. ⅝–⅜ premium for three months' delivery. Neglecting expenses and charges, what will be the eventual profit or loss on the transaction? (*Institute of Bankers*, 1932.)

Solution :—

Bankers' selling rate for 3 months' forward is \$3·755.

	£	s.	d.
Proceeds of sale of dollars = $£\frac{40{,}000}{3{\cdot}755}$	10,652	9	3
Cost of covering = $£\frac{40{,}000 \times 25{\cdot}53}{96}$	10,637	10	0
∴ Profit on transaction is	£14	19	3

Example 40.—A dealer finds the market in New York Guaranteed Mail Transfer for seven days ahead is 3·47⅝–⅞, while there are sellers of T.T. for forward delivery in seven days at 3·47⅝. Therefore, he sells G.M.T. and buys forward, and thus has the use of £100,000 for one week. Ascertain the rate of interest per cent. per annum he is paying for the use of the funds.

Solution :—

The dealer buys forward at 3·47⅝, and sells G.M.T. at 3·47⅞.

Therefore he gives away ¼ c. on every 3·47⅞ for one week.

∴ For 365 days he gives away ¼ c. $\times \frac{365}{7}$ per 347⅞ c.

∴ On 100 cents he gives away per year $\frac{{\cdot}25 \text{ c.} \times 365 \times 100}{7 \times 347{\cdot}875}$

$= 3{\cdot}747$ cents.

∴ The rate of interest paid by the dealer for the use of the funds

$= \underline{\text{(approx.) } 3\frac{3}{4} \text{ \% p.a.}}$

Example 41.—*Temporary Use of Sterling by Means of a Purchase of a Guaranteed Mail Transfer and Sale of Proceeds Forward.*

During 1929 certain restrictions were placed on the employment of foreign funds in the New York Call Money Market, and, as a result, it was not always possible for a London bank, wishing profitably to use surplus sterling for a week or 10 days, to adopt what had become a frequent practice and utilise the funds in New York, by buying spot and selling forward dollars, and using the spot on the New York Call Money Market at the higher rates prevailing there.

The London offices of American and Canadian banks have greater facilities in this direction, however, and they are usually ready to buy spot dollars and sell guaranteed mail transfers for payment in New York on a stated date, the sterling payment here being "compensated".

If, therefore, the forward margin will permit and the parties can agree on rates, a three-cornered deal can be carried out as follows:—

A wishes to use his sterling for 10 days at about 5 %.
B will sell spot dollars and buy 10 days forward, and wants $\frac{1}{8}$ c. in his favour for the "swap" (about 1 % p.a.).
C (the borrower) will buy spot dollars and sell G.M.T. on New York 10 days ahead, being willing to give away $\frac{11}{16}$ c. for the 10 days' run (about 6 % p.a.)
If, therefore, the spot rate is assumed to be 4·86:—
C buys spot dollars for the 10th from *B* and sells *A* G.M.T. for the 20th (i.e., he pays and receives sterling in London on the 10th, receives dollars in New York on the 10th and pays them out on the 20th).
B sells dollar T.T. deliverable 10th to *C* at 4·86, and buys dollar T.T. deliverable 20th from *A* at $4{\cdot}86\frac{1}{8}$. He pays out dollars and receives sterling on the 10th. On the 20th he receives dollars and pays out sterling.
A buys G.M.T. from *C* due 20th at $4{\cdot}86\frac{11}{16}$, selling forward dollars to *B* to cover for the 20th. Thus, he pays out sterling on the 10th. On the 20th he receives sterling and receives and pays dollars.

On the 10th.
A pays *C* sterling for G.M.T.
C uses sterling to pay for T.T. from *B*.
C receives dollars in New York from *B*.

On the 20th.
C uses dollars received from *B* on 10th to meet G.M.T. due to *A*.
A uses dollars from *C* to meet forward contract due to *B*.
B pays *A* sterling for forward T.T.

∴ *A* has used sterling from 10th to 20th for $\frac{3}{16}$ c. (practically 5 % p.a.).
B has had use of sterling but loses use of dollars for 10 days and receives $\frac{1}{8}$ c. compensation. (It evidently must suit him to have sterling instead of dollars or he would not do the deal.)
C has had use of dollars for 10 days without cost of sterling, but has to give away $\frac{11}{16}$ c. (6 % p.a.), so he can evidently use dollars at, say, 7 % p.a.

Example 42.—A London exchange operator has sold to a customer $20,000 T.T. Montreal for delivery in three months' time at the rate of $3{\cdot}75\frac{1}{2}$, which he has covered by a purchase of a similar amount of spot T.T. at the rate of 3·75. He must reckon that the sterling he uses in his spot purchase is worth 1 % p.a. to him, while he will receive interest on his account in Montreal at the rate of $2\frac{1}{2}$ % p.a. If the dealing rate in the London Market for three months' Montreal

against spot is 2½–3½ c. discount, what can the dealer do to improve the rate of profit shown by the transaction as it stands? Give full arithmetical reasoning.

(Take the period of the contract as being exactly one-quarter of a year and neglect charges and expenses.) (*Institute of Bankers*, 1933.)

Solution :—

By carrying out a swap (selling dollars spot and buying them forward) the banker would incur a loss of interest at the rate of (2½ — 1) % p.a., i.e., 1½ % p.a., or ⅜ % for three months, which, on a rate of $3·75, represents:—

$$\frac{3{\cdot}75 \times 3}{100 \times 8} = \${\cdot}014.$$

i.e., he *loses* interest amounting to 1·4 c. per £1 in three months.

But he *receives* on his swap a margin of 2½ c.

Hence, by swapping his spot dollars for delivery in three months he can effect a net gain of approximately 1 c. per £1.

Example 43.—*Option Deal in Francs.*

A dealer buys from a customer French francs for delivery at seller's option during August, and covers by selling spot at 124 for 31st July. On 28th July the customer notifies the dealer that the francs will not be delivered until the end of August. If one month forward francs are 35 to 40 c. discount, while the Paris overdraft rate is 8 % p.a., and London money is worth 4 %, what should the dealer do, and why?

Solution :—

Paris overdraft rate	..	..	..	8 % p.a.
London money rate	..	..	..	4 % p.a.
Difference in cost of funds	..	..	=	4 % p.a.

4 % p.a. on 124 for 1 month = 41⅓ c.

Therefore if the market quotes one month forward Paris at 35 to 40 c. discount, it is 1⅓ c. cheaper for the dealer to buy spot against one month forward at a difference of 40 c. against him than to have an overdraft in Paris at 8 %.

Example 44.—A London banker can borrow sterling for three months at 4½ %. He has the following possible investments: (*a*) Treasury bills at 4⅝ %; (*b*) any of the following currencies, by buying spot and selling forward at the margins given: New York, ⅝ c. premium, three months, interest 4 %; Paris 62 c. premium, three months, interest 2½ %; Amsterdam, 4½ c. premium, three months, interest 3 %; Berlin, 5⅛ pf. discount, three months, interest 6½ %. Spot rates are: New York, 4·85⅝; Paris, 123·92; Amsterdam, 12·12; Berlin, 20·50. Brokerages may be disregarded. Which investment should he choose, and what would be the profit on an investment of £100,000?

Solution :—

If the banker invests in Treasury bills at 4⅝ % *he gains approx.* ⅛ % *p.a.*, since he has to pay only 4½ % for the money which he invests.

If he buys spot and sells forward New York at ⅝ c. premium, he makes 2½ c. for a full year, which on $4·86 is ½ % p.a. (approx.). As the difference in interest between the two centres is ½ % p.a., *there is no profit in the operation.*

If he buys spot and sells forward Paris at 62 centimes premium, he makes Fcs. 2·48 in a full year, which on Fcs. 124 is 2% p.a. The difference in interest between the two centres is 2 % p.a., so again *he would make no profit.*

If he buys spot and sells forward Amsterdam at 4½ c. premium, he makes 18 c. on a full year, which on 12·12 is just less than 1½ % p.a. The difference in interest is 1½ % p.a. so that *he would make a small loss.*

If he buys spot and sells forward Berlin at 5⅛ pfennige discount, he will lose 20½ pfennige in a full year, which on 20·50 is 1 % p.a. loss. As he will make 2 % p.a. profit by the difference in interest between the two centres *he will make a net profit of* 1 % *p.a. by investing in Berlin.*

Hence he would operate in reichsmarks.

Purchase of reichsmarks @ 20·50 for £100,000			
realises		Rm. 2,050,000	
Add Interest @ 6½ % for 3 months		33,312·5	
Proceeds at Maturity		Rm. 2,083,312·5	
Sale of Rm. 2,083,312·5 @ 20·55⅛ realises			£ s. d.
£$\frac{2,083,312·5}{20·55125}$			101,371 11 5
Cost of loan is		£100,000	
Plus interest, 4½ %, 3 months		1,125	
			101,125 0 0
Profit			£246 11 5

Example 45.—A Dutch banker purchases a parcel of three months' bills on London at 8·60¾ and finds he can re-discount them at $\frac{11}{16}$ths % p.a. in the London Money Market. Spot sterling is quoted at 8·62¼–½ on the Amsterdam Bourse, and the three months' forward quotation is 1 c. over spot. Assuming that he can use florins at ½ % p.a. in Holland, ascertain whether he should hold the bills, or re-discount them.

Solution :—

If the banker holds the bills until maturity, for every £100 worth of bills he can sell £100 forward, realising in three months' time (at Fls. 8·63¼) *Florins* 863·25.

If he discounts his bills immediately he will receive £100 less discount, viz.:—

$$£100 \text{ less } £\frac{100 \times 11 \times 1}{4 \times 16 \times 100}$$

i.e., £100 less 3s. 5d.

= £99 16s. 7d.

By selling this spot, at Fls. 8·62¼, he realises		
Fls. 99·829 × 8·6225		Fls. 860·776
He can utilise these Florins at ½ % p.a.		
∴ *Add* Interest for 3 months		1·076
Net proceeds in 3 months' time		Fls. 861·852

Hence the first procedure is the more profitable, and the banker will hold the bills.

Example 46.—*Investment in Bank bills with Exchange Secured.*

A Swiss banker inquires by telegram at what rate a London banker can sell him £50,000 three months' bank bills " *en pension, change assuré*".

[NOTE.—*This order means that the Swiss banker wishes to utilise Swiss francs to invest in sterling bills, but not wishing to suffer any loss in exchange, desires the*

seller to hold the bills, to collect the sterling proceeds at maturity, and to re-convert these into Swiss francs at the same rate as was applied to the original purchase of sterling. From the London banker's point of view, this deal amounts to a sale of sterling bills, with the complication that he is to buy the Swiss banker's francs, and, on maturity of the bills, sell him the francs back at the same rate. Thus his quotation for the sale of the bills will be the ordinary market discount quotation, so adjusted as to allow the cost of the swap to be included.]

Assuming that the London banker is prepared to buy spot francs at 17·11 and to sell three months' forward at a premium of 2¼ c. on this rate, find the rate which he will quote to the Swiss banker if fine bank paper is quoted at $2\frac{9}{16}$ %, and he requires at least $\frac{1}{32}$ % in the bill rate for his profit. Show also the discount statement which he will forward to the Swiss banker.

Solution :—

The London banker agrees to take approximately £50,000 worth of Swiss francs at 17·11, and, at the end of three months, to sell them back at the same rate. But as this amounts to selling forward, he will charge the premium of 2¼ c. per three months or 9 c. p.a., on 1,711 c. This is equivalent to an annual percentage of $\frac{900}{1711}$ or ·526.

The bank bills can be obtained at		2·5625 % p.a.
Less Swap Cost	·526	
Profit	·03125	
	·55725	,, ,,
	2·00525	,, ,,

∴ The London banker would offer to sell the bills at 2 % p.a.

His discount statement to the Swiss banker would take the following form:—

DISCOUNT STATEMENT.

As agreed, we have sold you to-day £50,000 fine bank bills as per schedule attached.

Total: bills maturing	19..	£50,000
Less .. days' discount @ 2 % p.a. (for the purpose of this question an exact three months is assumed)		250
Sterling cost of bill		£49,750

Please pay our agents the Banque .... of Zurich, the franc cost of these bills, viz., £49,750 @ 17·11 = Fcs. 851,222·50.

We hold the bills in portfolio in your name, and on the due date, viz., ..., 19.., we shall instruct our agents to pay you the sum of Fcs. 855,500, being the equivalent of £50,000 @ 17·11 as agreed.

Example 47.—*Renewal of Currency Loan with Exchange Secured.*

A German banker has borrowed $100,000 from a London banker, and at maturity of the loan requests a three months' renewal. The London banker agrees to this on the basis of interest at 3 % p.a. plus " swap costs ". If New

York " spot " is either side of 3·31 and three months' forward dollars are quoted $\frac{1}{2}$–$\frac{3}{4}$ c. discount, work out the cost of the swap, and the gross rate per cent. p.a. (to two places of decimals) on the loan.

[NOTE.—*In order to provide the German banker with dollars, the London banker will have had to buy them himself, and will have sold them forward for delivery at the maturity of the loan. He will now have to make a fresh " swap " by buying spot dollars and selling " forward " against the renewal of the loan.*]

Solution :—

The banker will buy spot and sell forward at a difference of $\frac{3}{4}$ c. against him.

The cost of the " swap " is $\frac{3}{4}$ c. for 3 months, or 3 c. p.a., on 3·31 c.

$$= \frac{300}{331} = \cdot 907\ \%\ \text{p.a.}$$

Add Interest Charged	3·000 % p.a.
	3·907 % p.a.

∴ Gross Percentage Cost is 3·91 % p.a. (approx.).

Example 48.—At what rate can a London banker lend French francs for 3 months if the spot rate is 80·25 and forward swaps are quoted at 15–10 c. premium? Allow the banker 2 % p.a. for loss of interest on his funds and a further $\frac{1}{4}$ % flat for expenses and profit.

Solution :—

The profit on his swap (buying francs spot and selling them forward) is 10 c. on Fcs. 80·25.

$$= \frac{10}{8{,}025} \times \frac{100}{1} \times \frac{4}{1}\ \%\ \text{p.a.}$$

$= \frac{1}{2}$ % p.a. approximately.

Allowance for loss of interest	2 % p.a.
Expenses, $\frac{1}{4}$ % for 3 months, equivalent to	1 % p.a.
	3 % p.a.
Deduct Swap margin	$\frac{1}{2}$
Rate charged for loan	2$\frac{1}{2}$ % p.a.

Example 49.—Using the same figures as in the last example, give the answer if forward swaps had been 4–5 c. *discount*.

Solution:—

Swap cost (i.e., loss on swapping spot for forward)

$$= \frac{5}{8{,}025} \times \frac{100}{1} \times \frac{4}{1} = \frac{1}{4}\ \%\ \text{p.a. approx.}$$

Add other expenses	3 %
Rate charged for loan =	3$\frac{1}{4}$ % p.a.

Example 50.—*Indirect cover of Purchase of Forward Florins.*

A London banker buys from a customer 15,000 Dutch florins two months' forward. He is quoting a spot rate of 8·30$\frac{3}{4}$—·31$\frac{1}{4}$, and a forward rate of $\frac{1}{2}$–$\frac{1}{4}$ c. premium per month. He can sell florins two months' forward in Paris at 1,024 and the Market is quoting francs in London at 84$\frac{1}{4}$–$\frac{1}{2}$ spot, two months' forward

at par. Find (*a*) the amount with which the customer will be credited; and (*b*) the profit or loss accruing to the banker if he covers his purchase by means of a sale in Paris.

Solution :—

(*a*) The banker will buy the florins from the customer at the rate of $8 \cdot 31\frac{1}{4}$ less $(2 \times \frac{1}{4})$ c. $= 8 \cdot 30\frac{3}{4}$.

He will therefore credit his customer with $£\frac{15,000}{8 \cdot 3075} = £1,805 \cdot 597$

$= \underline{£1,805\ 11s.\ 11d.}$

(*b*) *By Chain Rule.*

? £ = Fls. 15,000

if Fls. 100 = Fcs. 1,024

and Fcs. 84·5 (Market's buying price) = £1 ?

$$\frac{150 \times 1,024}{84 \cdot 5} = \frac{153,600}{84 \cdot 5}$$

$= £1,817 \cdot 751$

	£	s.	d.
∴ Proceeds of an indirect sale *via* Paris	1,817	15	0
Amount credited to customer	1,805	11	11
∴ Banker's Profit	£12	3	1

Calculation of Long Rates and "Tel Quel" Rates from Forward Rates.—Competition for business nowadays forces exchange dealers to quote the finest possible rates for any business offered to them, and often a better long rate or *tel quel* rate can be quoted by basing the calculation on the price at which the currency can be *sold forward* for the maturity of the bill, and on the loss of interest, *at the home rate*, on the sterling which must be paid at once for the bill.

If the *foreign* interest rate is *lower* than the home interest rate this method cannot be used unless the forward margin more than compensates for the difference in interest. If the foreign interest rate is *higher* than the home rate and the forward margin does not absorb all the difference (as it seldom does), then the method may be applied with advantage to the customer.

Suppose, for instance, a banker is asked to quote a rate for the purchase of a three months' date bill on Amsterdam at a time when the T.T. rate on Amsterdam is Fls. 8·15–·20 to £1. Discount rate in Amsterdam is, say, 4 % p.a.; collecting commission is $\frac{1}{8}$ %, and Stamp duty, $\frac{1}{2}$ per mille.

In addition the following data are available: loan interest in London, 2 % p.a.; forward quotation for three months' florins is 6–4 c. premium.

The banker has two alternatives. He can either send the bill forward, have it discounted, and sell T.T. against the proceeds, or he can hold the bill until maturity, and sell *forward* against the proceeds.

(1) *Selling T.T. against Proceeds of Discount.*

In this case the basic rate is that at which the banker can sell T.T. to the Market, viz., 8·20. But he will require *more* florins from his customer, since he has to bear the cost of discount charges, collection commission and stamps. Hence he calculates as follows:—

Market buying rate	8·20
Add 3 months' Interest at 4 %	·082
Commission, $\frac{1}{8}$ %	·01
Stamp duty, $\frac{1}{2}$ per mille	·004
	8·296

The best possible rate he could quote to his customer would therefore be 8·296, say, 8·30 florins per £1.

(2) *Selling three months' forward against Proceeds of Collection.*

In this case, the basic rate is that at which the banker can sell three months' forward florins to the Market. Actually, he would sell spot to the Market at 8·20 and effect a swap at a difference of ·04 in his favour, making the cost of his cover 8·20 less ·04 = 8·16. The banker holds the bill as an investment, but loses interest on his sterling during the three months at 2 % (the rate which he could otherwise obtain on his funds). He must therefore make an allowance in his rate for this loss of interest, i.e., he treats the transaction as an advance of sterling, with the exchange secured. In addition, he will have to recoup himself for stamp and collection charges.

It will be observed that by selling forward at once, the banker squares his position and avoids any loss through exchange fluctuation.

Market buying rate for spot	8·20
Less Premium on forward swap	·04
	8·16
Add 3 months' Interest at 2 %	·041
Commission, $\frac{1}{8}$ %	·01
Stamp duty, $\frac{1}{2}$ per mille	·004
	8·215

The best possible rate he could quote would be 8·215, say, 8·22 florins per £1.

To this rate he would, of course, add his allowance for profit.

A comparison of the two methods shows that, in the second case, the banker is able to quote for the bill at a much lower rate than in the first method. Consequently, where competition is keen the banker is obliged to consider both ways of covering, and to quote at the lower rate.

Example 51.—What rate would a bank dealer apply to a bill at 90 days' sight on New York (*a*) if he bases his calculation on the forward rate for dollars; (*b*) if he calculates in the usual way?

Assume that the London on New York T.T. rates are 4·84$\frac{7}{8}$–·85; discount in London is 5 %, in New York (for similar bills), 6 %; the three months' forward margin on New York is $\frac{1}{2}$–$\frac{3}{4}$ c. discount; the cheque margin is $\frac{3}{8}$ c. discount, and the time of transit to New York, 8 days.

Solution :—

" Tel quel " rate based on Forward Price.

Market T.T. rate (buying)	$4·85
Allow 3 months' forward margin, $\frac{3}{4}$ c. + 8 days, say, $\frac{11}{32}$ c. ..	·008125
	$4·858125
Interest on the sterling for 98 days @ 5 %, London terms (365 days)	·06521
	$4·923335

∴ Neglecting stamps, brokerage and profit, rate to be applied is, say, $4·92$\frac{11}{32}$ per £1.

[NOTE.—It is assumed that the discount rate of 5 % in London represents the yield which the London banker could have obtained on his sterling funds.]

" Tel quel " rate based on Spot Rate and Foreign Interest.

T.T. rate	$4·85
Cheque margin (allowance for time in transit)	·00375
	$4·85375
Interest for 90 days @ 6 %, New York terms (360) days	·072806
	$4·926556

∴ Neglecting extras as above, rate to be applied is, say, $4·92$\frac{21}{32}$ per £1.

If the purchase is made on the basis of the first method, the banker must be prepared to hold the bill until maturity, since, if he were pressed for funds and was compelled to re-discount during the bill's currency, he would, of course, have to re-discount in New York at 6 % p.a., and, by so doing, he would lose part of the difference between the New York interest rate and the London interest rate *plus* the forward margin.

Example 52.—A banker has to quote competitively for a three months' bill, on Spain when the Market is quoting:—

Spot pesetas	$40\frac{1}{8}$–$\frac{3}{8}$
3 months' forward	$\frac{1}{4}$–$\frac{1}{2}$ peseta discount
Discount rate in Madrid	$6\frac{1}{2}$ %
Loan interest in London	5 %
Stamp duty	$\frac{1}{2}$ ‰
Commissions and profit	$\frac{1}{4}$ %

What price will he offer for the bill?

Solution :—

The banker can consider the bill from two angles:—

(1) He may build up a long rate in the ordinary way on the assumption that he sells spot and re-discounts the bill at once in Madrid. In this case he can quote:—

Short Rate (he covers by *selling* spot) ..	40·375
Plus Commission at $\frac{1}{4}$ %	·10094
Stamps at $\frac{1}{2}$ ‰	·02019
Discount abroad, 3 months at $6\frac{1}{2}$ %	·65609
	41·15222

He can quote $41\frac{1}{4}$ pesetas per £1.

(2) He can consider the transaction as merely being a loan of sterling, having first secured the forward rate by selling the proceeds forward.

In this case he can sell spot at 40·375 and effect a swap at a difference of ½ peseta against him.

Spot rate	40·375
Add Forward margin	·500
Stamps	·02044
Commission	·10219
Interest (on sterling advances) 3 months at 5 %	·51094
	41·50857

As this rate is *less competitive* than that obtained by the first method, the banker will quote the first rate, i.e., 41¼ pesetas per £1, for the business.

Example 53.—On 28th September, 1932, a customer asks you to negotiate a bill on Amsterdam for Fls. 9,327·75, due 30th December, 1932. From the following data calculate (*a*) the rate of exchange, to the nearest ⅛ c., at which the bill should be negotiated, and (*b*) the amount of sterling with which you should credit the customer:—

T.T. rate London on Amsterdam	8·36¼–½
3 months' forward (for 30th December)	½–1 c. discount
Discount rate for 3 months' commercial bills in London	2½ % p.a.
Discount rate for 3 months' commercial bills in Amsterdam	2¾ % p.a.
Dutch stamp	½ per mille
Bankers' profit	½ per mille

(Take the period as being exactly one-quarter of a year.) (*Institute of Bankers*, 1934.)

Solution :—

(*a*) (i) *Basing Long Rate on Forward cover* :—

Market buying rate for T.T.	Fls. 8·365
Add 3 months' forward margin	·01
Bankers' profit and stamp-duty, 1 per mille	·0084
Interest, 3 months at 2½ % p.a. ..	·0523
	Fls. 8·4357

(ii) *Basing Long Rate on Re-discount* :—

Market buying rate for T.T.	Fls. 8·365
Add Interest, 3 months @ 2¾ % p.a. ..	·0575
Bankers' profit and stamp-duty, 1 per mille	·0084
	Fls. 8·4309

As the second method produces the most competitive rate, the banker will negotiate the *bill at this rate*, say, Fls. 8·43⅛.

(*b*) Proceeds of bill, converted at Fls. 8·43125

$$= £\frac{9{,}327\cdot75}{8\cdot43125}$$

$$= £1{,}106\ 6s.\ 7d.$$

Example 54.—You are asked to quote a competitive rate for the purchase from a customer of a 90 d/s bill on San Francisco for $5,000. T.T. New York is quoted in London at $4·66⅛—¼ and 3 months' forward at 1¼—1 c. premium. The charge for transfers of funds from San Francisco to New York is $\frac{1}{16}$ c. per £1.

If sterling can be used for 90 days in London at 3½ % p.a., and the discount rate in New York is 3 % p.a., what is the best rate you can quote?

Take 360 days to the year, and allow yourself $\frac{1}{16}$ c. profit in the rate. Ignore stamps and expenses.

Solution :—

LONG RATE BASED ON NEW YORK T.T. RATE AND U.S. DISCOUNT RATE.

T.T. rate	$4·6625
Add Discount 90 days at 3 %	·034969
Transfer charge, $\frac{1}{16}$ c.	·000625
Profit, $\frac{1}{16}$ c.	·000625
	$4·698719

∴ The best rate would be $4·69$\frac{7}{8}$ (to nearest $\frac{1}{32}$ c.).

LONG RATE BASED ON THE FORWARD RATE.

T.T. rate	$4·6625
Less Premium on forward swap	·01
	4·6525
Add Loss of Interest, 90 days at 3½ % (on 4·6625) ..	·040797
Transfer charge, $\frac{1}{16}$ c.	·000625
Profit, $\frac{1}{16}$ c.	·000625
	$4·694547

∴ The best rate would be $4·69$\frac{15}{32}$.

Hence, the finest competitive rate which the dealer could quote would be $4·69$\frac{15}{32}$ per £, based on a forward sale of the dollars.

The Short-Swap Margin.—The margin between the M.T. (or cheque) rate and the T.T. rate is often based on the "short swap" margin. For example, if the margin for forward dollars is very wide, the spread between cheque and T.T. based purely on interest rates may show a divergence from current conceptions as to the worth of dollars payable ten days ahead. In some cases, the cheque rate tends to move towards a point which will reflect the wide margin of the forward quotations, since it is possible for a banker who *sells* a cheque on New York to cover by buying T.T. and then to swap his spot dollars for dollars deliverable in, say, ten days. By so doing, he neither suffers nor gains any loss of interest in New York, but he gains interest on his sterling in London and must also allow for the "difference" paid or received on the swap. Conversely, a banker who *buys* cheque on New York can cover by selling T.T. and then buying spot against a sale ten days forward: by so doing, he neither gains nor loses interest in New York

but must allow for the loss of interest on the sterling paid for the cheque and also for the swap margin.

The following example will illustrate this more clearly:—

Example 55.—A banker is willing to deal in T.T. New York at 4·49¾—·50. Forward dollars are at a premium of 2–1½ c. for one month, 6–4½ c. for three months. Interest in New York is 4 % on overdrawn accounts. In London money is usable at 2 %. At what rate will the banker buy cheque on New York?

Solution :—

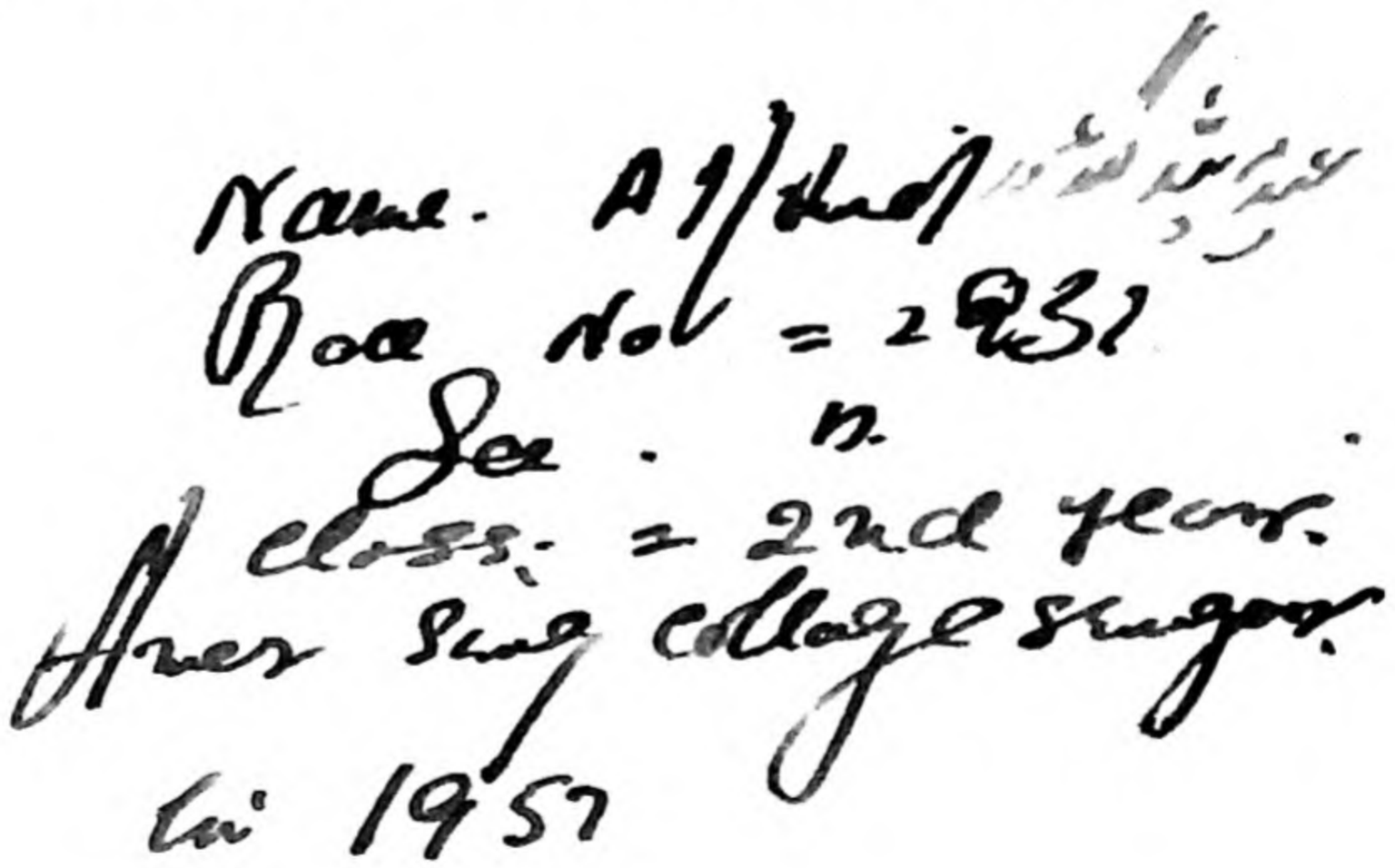
(*a*) Cheque rate based on overdraft interest:—

Banker's buying rate for T.T.	$4·50
Plus Interest for 10 days @ 4 %	·005
Buying rate for cheques	$4·50½

(*b*) Cheque rate based on forwards:—

Spot	4·50
Less 10 days forward (say ⅓rd of 1½ c.)	·005
	4·495
Add Interest on sterling paid for cheque now (10 days at 2 %)	·0025
	4·4975

The rate will probably tend to be nearer 4·49¾ rather than 4·50½, i.e., the banker can quote a competitive rate based on the short-swap margin.



CHAPTER XXXI

MISCELLANEOUS PROBLEMS ON THE EXCHANGES

THE following worked examples, some of which have been chosen from past examination papers, are designed to afford the reader a variety of problems for study and practice.

In certain cases, exchange quotations which are now obsolete are included in the examination questions reproduced, but these have not been altered as no change of principle is involved.

Unless otherwise stated, the reference "*Inst. of Bankers*" at the end of certain questions refers to the English Institute, and the two Parts of the Associate Examination of that Institute are indicated by the abbreviations "I" and "II" respectively.

Eastern Currencies.

Example 1.—Find equivalent in taels of £217 10s. 6d. @ 2s. 6¾d. per tael.

Solution :—

£217 10s. 6d. = 217·525
2s. 6¾d. = ·128125

$$\text{No. of taels} = \frac{217 \cdot 525}{\cdot 128125}$$

12′8′1′2′5)217525(1697·75
89400
12525
994
97
7

1,697·75 taels.

Example 2.—A banker sells his customer T.T. on Bombay for Rs. 500,000 at 1s. 6¼d. and covers by buying a T.T. for Rs. 300,000 at 1s. 6⅛d. and a cheque for Rs. 200,000 at 1s. 6d. Allowing interest on his overdraft in Bombay at 6 per cent., calculate his profit. Mailing period is 21 days.

Solution :—

Proceeds of Rs. 500,000 at 1s. 6¼d.

	£	s.	d.	£	s.	d.
Rs. 500,000 @ 1s.	25,000	0	0			
@ 3d.	6,250	0	0			
@ 3d.	6,250	0	0			
@ ¼d.	520	16	8			
				38,020	16	8

Cost of Rs. 300,000 @ 1s. 6⅛d.

	£	s.	d.	£	s.	d.
Rs. 300,000 @ 1s.	15,000	0	0			
@ 3d.	3,750	0	0			
@ 3d.	3,750	0	0			
@ ⅛d.	156	5	0			
				22,656	5	0

Cost of Rs. 200,000 @ 1s. 6d.

	£	s.	d.			
Rs. 200,000 @ 1s.	10,000	0	0			
@ 6d.	5,000	0	0			
				15,000	0	0
Interest on £15,000, for 21 days at 6 % ..				51	15	8
Total cost				£37,708	0	8

Profit = £38,020 16s. 8d. *minus* £37,708 0s. 8d.

= £312 16s.

Example 3.—Standard silver in London is worth 3s. 6d. per oz. troy. If a rupee contains ⅜ oz. of silver, $\frac{11}{12}$ths fine, find the metallic parity between a sovereign and a rupee.

Solution :—

? Rupees = £1

£1 = 20s.

3·5s. = $\frac{37}{40}$ oz. of fine silver

Oz. fine silver $\frac{3}{8} \times \frac{11}{12}$ = 1 rupee

$$= \frac{20 \times 37 \times 96}{40 \times 3 \cdot 5 \times 33}$$

= 15·376 rupees

= 15 rupees 6 annas.

NOTE.—Answers expressed in Indian currency should always be given in rupees and annas, and not in decimal form.

Example 4.—A London banker buys a cheque on Bombay for Rs. 100,000 at a rate of 1s. 6¼d. Against it he sells T.T. at 1s. 6⅜d. for delivery in 21 days, i.e., at approximately the date when the proceeds of the cheque will be credited to him. Calculate the profit and the yield on his money.

Solution :—

Cost of Rs. 100,000 @ 1s. 6¼d.

		£	s.	d.	£	s.	d.
Rs. 100,000	@ 1s.	5,000	0	0			
	@ 3d.	1,250	0	0			
	@ 3d.	1,250	0	0			
	@ ¼d.	104	3	4			
					7,604	3	4

Proceeds of Rs. 100,000 @ 1s. 6⅜d.

		£	s.	d.	£	s.	d.
Rs. 100,000	@ 1s.	5,000	0	0			
	@ 3d.	1,250	0	0			
	@ 3d.	1,250	0	0			
	@ ⅜d.	156	5	0			
					7,656	5	0
	Banker's profit				£52	1	8

$$\text{Yield is } \frac{\text{£52 1s. 8d.}}{\text{£7604 3s. 4d.}} \times \frac{365}{21} \times \frac{100}{1} \text{ per cent. p.a.}$$

$$= \underline{11 \cdot 9 \text{ per cent. p.a.}}$$

Example 5.—A Bombay merchant owes Paris Fcs. 10,000, and a bill on Paris can be obtained @ 2·5 as. per franc. If exchange on London is 2s. 6d., and London quotes Paris at Fcs. 50·5, which is the best way of payment, direct or via London? Neglect charges.

Solution —

Payment direct costs 25,000 as. = Rs. 1,562·5

Indirect.

? Rupees = 10,000 francs
50·5 = 20s.
2·5 = 1 rupee = Rs. 1,584·15

Payment direct is therefore cheaper by Rs. 21·65

i.e., 21 rupees 10 annas.

Example 6.—If Rs. 8·5 = £1, and a Shanghai tael is worth 8s. 3d., how many rupees must be sent from Calcutta to Shanghai to pay a debt of 1,000 taels?

Solution :—

? Rupees = 1,000 taels
1 tael = £·4125
£1 = Rs. 8·5
= 8·5 × 412·5
= 3,506 rupees 4 annas.

Example 7.—For what amount would you issue a draft on Lucknow in rupees, against payment of £526 18s. 7d., the rupee rate being 1s. 3$\frac{5}{11}$d.? In your calculations make an allowance of $\frac{1}{16}$ per cent. commission paid by the customer. (*Inst. of Bankers, I*, 1922.)

Solution :—

£526 18s. 7d. = £526·929
Deduct charges $\frac{1}{16}$ per cent. = ·329
526·600

Rate of exchange = 1s. $3\frac{2}{3}\frac{7}{2}$d. = 15·843d.

$$\therefore \text{Amount of draft} = \frac{526 \cdot 6 \times 240}{15 \cdot 843} = \frac{42128 \cdot 0}{5 \cdot 281}$$

$$= \underline{7{,}977 \text{ rupees.}}$$

Example 8.—The basis of exchange between Japan and London is, by general consent, the rate for telegraphic transfers on London, and in practice the demand rate is based on the T.T. rate. Given a rate for telegraphic transfers, Kobe on London, 2s. $1\frac{3}{4}$d. per yen, find the rate of exchange for demand bills. (Time of mail 45 days; London discount rate $3\frac{1}{2}$ %.) (*Inst. of Bankers, II*, 1924.)

Solution :—

The rate for T.T. Kobe *on* London is 2s. $1\frac{3}{4}$d. Demand bills will be cheaper, and the rate must therefore be adjusted by adding interest at $3\frac{1}{2}$ per cent. for 45 days :—

T.T. rate Kobe on London, 2s. $1\frac{3}{4}$d. = 25·75d.
45 days' interest at $3\frac{1}{2}$ %

$$\frac{25 \cdot 75 \times 7 \times 45}{73000} = \frac{8111 \cdot 25}{73000}$$

·0811125 ($\frac{1}{10}$$\frac{1}{10}$$\frac{1}{10}$$\frac{1}{10}$$\frac{1}{10}$$\frac{1}{10}$th)
·0270375 ($\frac{1}{3}$ of above)
·0027037 ($\frac{1}{10}$ of above)
·0002704 ($\frac{1}{10}$ of above)
·1111241
·00001 (*less* $\frac{1}{100000}$ of total)
·1111141

= ·1111
25·8611d.

= 2s. $1\frac{7}{8}$d.

Example 9.—If exchange Shanghai on Hong Kong is quoted at 73·33 taels for $100, and Hong Kong on India is quoted at $100 for $137\frac{1}{2}$ rupees, and the sterling quotation for rupees is 1s. 4d., what is the sterling value of the tael? Chain rule may be used to arrive at the result. (*Inst. of Bankers, II*, 1922.)

Solution :—

How many pence = 1 tael
if 73·33 taels = 100 dollars
if 100 dollars = $137\frac{1}{2}$ rupees
and 1 rupee = 16d. ?

$$\frac{100 \times 275 \times 16}{73 \cdot 33 \times 100 \times 2} = \frac{2200}{73 \cdot 33}$$

= 30·001

= 2s. 6d.

Example 10.—An Indian customer sends to you from Bombay a 90 days' sight bill for £30,000, with instructions to get the bill discounted on the London market immediately after acceptance, and then to remit the proceeds by telegraphic transfer to Bombay. Show the amount of the proceeds obtained in London (Bank rate $5\frac{1}{2}$ %, stamp duty 1s. per £100, your commission $\frac{1}{4}$ %), and the sum, in rupees, remitted to India. Rate for remitting proceeds to Bombay, 1s. $3\frac{3}{4}$d. per rupee. (*Inst. of Bankers, II*, 1922.)

Solution :—

Amount of bill .. .. =			£30,000 0 0
Less 92 * days' interest at 5½ % =	£415	17 10	
Stamp duty, 1s. % .. .. =	15	0 0	
Commission, ¼ % .. .. .. =	75	0 0	
			505 17 10
Proceeds to be remitted to Bombay			£29,494 2 2

$$\text{Amount in rupees} = \frac{29494 \cdot 1083 \times 240 \times 4}{63}$$

$$= \underline{4,49,434 \text{ rupees.}}$$

* 90 days' sight plus three days' grace *less* one day allowed for acceptance. The bill would be left with the drawees for acceptance, picked up the next day and discounted at once. But, as the acceptance will be dated as from the day of sighting, one day of the usance will have run when the bill is discounted.

Example 11.—A banker in Shanghai sells T.T. on London at 2s. 4d., and covers his sales by purchasing 4 months' bills at 2s. 4⅝d. If London discount rate is 4 %, what is his net profit per cent. on the transaction? Assuming that a month elapses between the time of drawing the T.T. and arrival of the bills in London, what rate per cent. per annum is earned? Allow brokerage @ ⅛ %, and stamp @ ½ per mille.

Solution :—

⅝d. on 2s. 4d. = £2 4s. 8d. per cent.,

	£	s.	d.	£	s.	d.
∴ Gross profit per cent. = ...				2	4	8
	£	s.	d.			
Less 4 months' discount @ 4 %	1	6	8			
Brokerage @ ⅛ %		2	6			
Stamp ½ per mille		1	0			
				1	10	2
Net profit per cent.					14	6

This profit is made in a transaction covering one month,

∴ Rate per annum = 14s. 6d. × 12

= £8 14s. per cent.

Example 12.—Find the amount realised in pence per tael by purchasing silver ·994 fine in Shanghai at 111·10 taels currency per 100 taels weight and selling it in London at 24d. per oz. standard (·925 fine). Allow for charges at ¾ %. (1 tael weighs 579·84 grains.)

Solution :—

? pence = 1 tael

if 111·10 taels currency = 100 taels weight

1 tael weight = 579·84 grains ·994 fine

·925 grain fine = 1 grain standard

480 grains standard = 24 pence?

∴ Amount realised in pence per tael, neglecting charges

$$= \frac{100 \times 579 \cdot 84 \times \cdot 994 \times 24}{111 \cdot 10 \times \cdot 925 \times 480}$$

= 28·042d.

Less charges @ ¾ % .. = ·210

Amount realised .. = 27·832d. per tael.

Premium or Discount.

As is pointed out on page 111, the currency unit of one country is frequently referred to as being at a *premium* or at a *discount* in another centre, i.e., when compared with the currency of that centre. Thus, the franc may be at a discount of, say, 15 % in New York, while the dollar may be at a premium of, say, 4 % in London.

This premium or discount can be calculated by expressing the current value of the currency unit concerned (as expressed in the current quotation) *as a percentage of its normal or Mint Par value.* If this percentage is above 100, the excess represents the premium on the currency; while if the percentage is below par, the deficit represents the discount on the currency concerned.

Example 13.—*Sterling and dollar in New York.*

In New York, London is quoted at 4·75. (*a*) At what premium or discount per cent. does sterling stand in relation to the dollar if the Mint Par is 4·8665? (*b*) What is the premium or discount per cent. on the dollar in New York in terms of sterling?

Solution :—

(*a*) Current value of £1 = \$4·75

Par value of £1 = \$4·8665

$$\therefore \text{Current value} = \frac{4\cdot75}{4\cdot8665} \times \frac{100}{1}\ \% \text{ of par value.}$$

$$= 97\cdot6\ \% \text{ of par value.}$$

∴ Sterling is at a discount of 2·4 % in terms of dollars.

(*b*) Current sterling value of \$1 = $£\frac{1}{4\cdot75}$

Par value of \$1 = $\frac{1}{4\cdot8665}$

$$\therefore \text{Current value} = \frac{\frac{1}{4\cdot75} \times 100}{\frac{1}{4\cdot8665}}\ \% \text{ of par value.}$$

$$= \frac{4\cdot8665 \times 100}{4\cdot75}\ \% \text{ of par value}$$

$$= 102\cdot45\ \% \text{ of par value.}$$

∴ Dollar in New York stands at a premium of 2·45 % in terms of sterling.

Example 14.—*Rupees in London.*

In London, T.T. on Bombay is quoted at $18\frac{5}{16}$. What is the premium or discount per cent. on rupees in relation to sterling if the parity is 18d.?

Solution :—

$$\text{Current value of 1 Rupee} = 18{\cdot}3125\text{d.}$$
$$\text{Par value of 1 Rupee} = 18\text{d.}$$
$$\therefore \text{Current value} = \frac{18{\cdot}3125}{18} \times \frac{100}{1}\ \%\ \text{of par value}$$
$$= 101{\cdot}74\ \%\ \text{of par value.}$$

$\therefore$ Premium on rupees $= 1{\cdot}74\ \%$.

Example 15.—*The Franc in London.*

Prior to the devaluation of the franc in 1928, the London T.T. rate on Paris stood at 124·5. What was the discount on the franc in London, if the Mint Par was 25·2215 per £?

Solution :—

$$\text{Current value of 1 franc} = £\frac{1}{124{\cdot}5}$$
$$\text{Par value of 1 franc} = £\frac{1}{25{\cdot}2215}$$
$$\therefore \text{Current value of 1 franc} = \frac{\frac{1}{124{\cdot}5} \times 100}{\frac{1}{25{\cdot}2215}}\ \%\ \text{of par value}$$
$$= \frac{25{\cdot}2215 \times 100}{124{\cdot}5}\ \%$$
$$= 20{\cdot}26\ \%\ \text{of par value.}$$

$\therefore$ Francs were at a discount of $79{\cdot}74\ \%$ in relation to sterling.

Example 16.—*Sterling in Paris.*

In Paris, London is quoted at 125·15. If the Mint Par is 124·2134, what is the premium or discount per cent. on sterling?

Solution :—

$$\text{Current value of £1} = \text{Fcs. } 125{\cdot}15$$
$$\text{Par value of £1} = 124{\cdot}2134$$
$$\therefore \text{Current value} = \frac{125{\cdot}15}{124{\cdot}2134} \times 100\ \%\ \text{of par value}$$
$$= 100{\cdot}75\ \%$$

$\therefore$ Sterling in Paris stands at a premium of $\cdot 75\ \%$.

Example 17.—*Dollars and Sterling in London.*

If the London quotation for dollars is \$3·25 per £, find (*a*) the discount on sterling in terms of dollars, and (*b*) the premium on dollars in terms of pounds, assuming the Mint Par to be 4·8665.

Solution :—

(*a*)

$$\text{Current value of £1} = \$3{\cdot}25$$
$$\text{Par value of £1} = \$4{\cdot}8665$$
$$\therefore \text{Current value of £1} = \frac{3{\cdot}25}{4{\cdot}8665} \times \frac{100}{1}\ \%\ \text{of par value}$$
$$= 66{\cdot}78\ \%\ \text{of Mint Par value.}$$

$\therefore$ Discount on sterling $= 33{\cdot}22\ \%$.

(*b*) Current value of \$1 = £$\frac{1}{3 \cdot 25}$

Par value of \$1 = £$\frac{1}{4 \cdot 8665}$

$$\therefore \text{Current value of \$1} = \frac{\frac{1}{3 \cdot 25} \times 100}{\frac{1}{4 \cdot 8665}} \% \text{ of par value.}$$

$$= \frac{4 \cdot 8665 \times 100}{3 \cdot 25} \%$$

$= 149 \cdot 74 \%$ of par value.

$\therefore$ Premium on dollars $= 49 \cdot 74 \%$.

Example 18.—*Sterling and the Peso.*

Exchange between London and Buenos Aires stands at $47\frac{1}{2}$. What is the premium on sterling and the discount on the peso if the Mint Par is 47·577d. per peso?

Solution :—

(*a*) Premium on Sterling.

Par value of £1 = $\frac{240}{47 \cdot 577}$ pesos

Current value of £1 = $\frac{240}{47 \cdot 5}$ pesos = $\frac{47 \cdot 577 \times 100}{47 \cdot 5}$ % of Mint Par

$= 100 \cdot 1621 \%$.

$\therefore$ Premium on sterling $= \cdot 1621 \%$.*

(*b*) Discount on the Peso.

Par value of 1 peso = 47·577d.

Current value of 1 peso = 47·5d. = $\frac{47 \cdot 5 \times 100}{47 \cdot 577}$ % of Mint Par

$= 99 \cdot 8382 \%$.

$\therefore$ Discount on peso $= \cdot 1618 \%$.*

Example 19.—*Sterling in Buenos Aires.*

English money being at a discount of 35 % in Buenos Aires, what is the approximate rate of exchange if the par is 47·58 pence? What is the cost of a bill on London for £1,000?

Solution :—

Par value of peso = 47·58 pence.

Current value of peso = $\frac{47 \cdot 58 \times 100}{65}$

$= 73 \cdot 2$ pence.*

$\therefore$ Exchange Rate = 73·2 pence per peso.

Cost of £1,000 bill on London = $\frac{1000 \times 240}{73 \cdot 2}$ pesos

$= 3278 \cdot 7$ pesos.*

* The rates and amounts refer to *gold* pesos.

Example 20.—(1) If on a certain date the New York rate on Amsterdam is \$40·28 for 100 florins, and on the same date the London rate on Amsterdam is 8·45, what is the parity between dollars and sterling?

(2) Assuming that sterling is actually quoted in New York at about the parity calculated above, at what premium or discount does sterling stand in relation to dollars, the mint parity being taken as \$4·8665?

Solution :—

(1) How many dollars = £1
if £1 = 8·45 florins
100 florins = \$40·28?

$$= \frac{40 \cdot 28 \times 8 \cdot 45}{100} \text{ dollars.}$$

∴ Parity rate is 3·4037 dollars = £1.

(2) Present value of £1 (at parity rate) = \$3·4037
Mint Par value of £1 = \$4·8665

$$\therefore \text{Present value} = \frac{3 \cdot 4037}{4 \cdot 8665} \times 100\ \% \text{ of par value.}$$

$$= 69 \cdot 96\ \% \text{ of par value.}$$

∴ Sterling is at a discount of 30 % (approximately).

Premium or Discount and Forward Rates.

The *margin* at which a forward rate is quoted is, of course, a premium or discount on the spot rate, but it is expressed in the form of an *absolute* (as distinct from a *percentage*) premium or discount.

Thus, when spot dollars are quoted at \$4·25 = £1, forward may be quoted at a discount of, say, 2 cents. This is very different from a discount of 2 *per cent.*, for it means that forward dollars are quoted at \$4·25 + ·02 = \$4·27.

If the discount were 2 *per cent.*, the absolute margin would be:—

$$\frac{2}{100} \times \frac{4 \cdot 25}{1} = \$ \cdot 08\tfrac{1}{2}, \text{ or } 8\tfrac{1}{2} \text{ cents.}$$

The margin of 2 cents represents a *percentage* discount of:—

$$\frac{\cdot 02}{4 \cdot 25} \times \frac{100}{1} = \cdot 47 \text{ per cent.}$$

It will be seen that there is a wide difference between the two margins.

Appreciation or Depreciation.

An exchange rate or currency unit is frequently referred to as having appreciated or depreciated by a given amount per cent. This percentage appreciation or depreciation is calculated in exactly the same way as premium or discount by a comparison of the current

value of the unit we are considering with its normal (or Mint Par) value, *in terms of the other currency*.

Example 21.—*The Franc in London.*

The franc in London moves from 25 to 125. What is the percentage depreciation?

Solution :—

$$\text{Original value of 1 franc} = £\frac{1}{25}$$

$$\text{Current value of 1 franc} = £\frac{1}{125} = \frac{25}{125} \times 100\,\% \text{ of original value.}$$

$$= 20\,\% \text{ of original value.}$$

$$\therefore \underline{\text{Percentage depreciation} = 80\,\%}.$$

Example 22.—*Sterling and the Dollar.*

Exchange between London and New York moves from 4·8668 to 4·695. What is the percentage depreciation of sterling and the percentage appreciation of the dollar?

Solution :—

(*a*) DEPRECIATION OF STERLING.

$$\text{Original value of £1} = \$4{\cdot}8668$$

$$\therefore \text{Current value of £1} = \$4{\cdot}695 = \frac{4{\cdot}695 \times 100}{4{\cdot}8668}\,\% \text{ of original value.}$$

$$= 96{\cdot}5\,\%.$$

$$\therefore \underline{\text{Depreciation of sterling} = 3{\cdot}5\,\%}.$$

(*b*) APPRECIATION OF THE DOLLAR.

$$\text{Original value of \$} = £\frac{1}{4{\cdot}8668}$$

$$\therefore \text{Current value of \$1} = £\frac{1}{4{\cdot}695} = \frac{4{\cdot}8668 \times 100}{4{\cdot}695}\% \text{ of original value.}$$

$$= 103{\cdot}7\,\%.$$

$$\therefore \underline{\text{Appreciation of the dollar} = 3{\cdot}7\,\%}.$$

Premium on Gold.

Example 23.—Suppose the sovereign is equal to 20 gold dollars of a certain country, but that the currency of the latter country has become inconvertible and gold is at a premium of 200 per cent. What is the current value of the sovereign?

Solution :—

100 gold dollars are equal to 300 paper dollars,

$$\therefore 1 \text{ gold dollar} = \frac{300}{100} = 3 \text{ paper dollars.}$$

$$\therefore \text{If £1} = 20 \text{ gold dollars,}$$

$$\text{It must} = 20 \times 3 \text{ paper dollars} = \underline{60 \text{ paper dollars.}}$$

Example 24.—

Mint Par between England and Turkey = Pstrs. 110 per £1.
Premium on gold in Turkey = 810 %.

What is the current value of the gold sovereign?

Solution :—

100 gold pstrs. = 910 paper pstrs.

$\therefore$ 1 gold pstr. = $\frac{910}{100}$ paper pstrs.

But £1 = 110 gold pstrs.

$\therefore$ £1 = $\frac{110 \times 910}{100}$

= 1,001 paper piastres.

Example 25.—If gold is at a premium of 810 % in Turkey, what is the discount at which the paper piastre stands in relation to the gold piastre?

Solution :—

At 810 % premium 100 gold pstrs. = 910 paper piastres.

Present value of 1 paper piastre = $\frac{100}{910}$ piastres gold.

Normal value of 1 paper piastre = 1 piastre gold.

$\therefore$ Present value of paper piastre = $\frac{100 \times 100}{910}$ % of normal value.

= 11 % (approx.).

$\therefore$ Paper piastre stands at 89 % discount (approx.).

Example 26.—If the ratio between the Argentine paper peso (the circulating medium within the country) and the gold peso is legally fixed at 44 c. gold = 1 peso paper, what is the premium on gold?

Solution :—

44 pesos gold = 100 pesos paper.

$\therefore$ 100 pesos gold = $\frac{100 \times 100}{44}$ pesos paper.

= 227·27 pesos paper.

Premium on gold = 127·27 per cent.

Miscellaneous Problems.

Example 27.—A broker in London bought a cheque on Melbourne at 2½ % discount, and sold it at 1¼ % premium. Find the gain per cent. on the outlay. If the amount of the bill was £1,000, what is the actual gain if the broker borrows money from a bank at 4 % and one month elapsed between the purchase and sale?

Solution :—

£100 bill on Australia costs £97½
£100 bill on Australia sells @ £101¼
∴ Gain on £97½ (outlay) = 3¾

$$\therefore \text{Gain on £100 (outlay)} = \frac{15}{4} \times \frac{100 \times 2}{195}$$
$$= 3 \cdot 846.$$

Say, $3\frac{27}{32}$ %.

The £1,000 bill costs £975
The £1,000 bill sells for £1,012·5

∴ Actual gain	=	£37·5
Deduct interest on £975 for 1 month @ 4 %	..	3·25
Net gain	..	£34·25
	=	£34 5s.

Example 28.—On 5th February, 1920, you receive an order to remit bills drawn on Paris @ 48·50, Brussels @ 48·40, or Amsterdam @ 9·10, or the nearest rate. On going into the market the quotations are: Paris 48·25–·30, Brussels 48·15–·20, Amsterdam 8·72–·75; which rate would you choose and why?

Solution —

All rates are worse for buying, as they have all fallen:—

Paris.	Brussels.	Amsterdam.
$\frac{48 \cdot 25}{48 \cdot 50} = \cdot 994845$	$\frac{48 \cdot 15}{48 \cdot 40} = \cdot 994834$	$\frac{8 \cdot 72}{9 \cdot 10} = \cdot 958$

The Paris rate is therefore slightly nearer the limit than the Brussels rate, so bills on Paris should be purchased.

Example 29.—(*a*) On 31st January, 1920, exchange quotations being

Copenhagen	22·03–22·07
Berlin	290–297,

at what rates would you have issued drafts so as to allow your bank a gross profit of ⅛ % on both places. Rates to be quoted to the nearest manageable fraction, e.g., Copenhagen—nearest ¼ öre; Berlin—nearest 10 pfennige. (*Inst. of Bankers, II*, 1920.)

Solution :—

The first rate—i.e., the selling price—must be used in both cases.

Copenhagen	22·03
Less ⅛ %	·0275
	22·0025

Rate to be charged = 22·00¼ kr. per £1

Berlin	290
Less ⅛ %	·3625
	289·6375

Rate to be charged = 289·6 marks per £1

(*b*) For what amount would you have issued a draft on Berlin against payment of £769 8s. 2d.—rate as above?

Solution :—

(1) Payment	£769·408
Rate	6·982
	153881·6
	61552·6
	6924·6
	461·6
	222820·4

Amount of draft = 222,820·40 marks.

Example 30.—On a day when you are able to deal in Belgas in the Market at Belgas 20·35–·40, you receive from a Belgian correspondent a draft on a British trading firm for Belgas 3,280, bearing the clause "Payable without loss in exchange", which you are asked to collect. Allowing yourself a margin of 5 c. in the rate to cover your expenses and commission, calculate the sterling amount which you should demand from the drawee.

Solution :—

Banker's *selling* rate for T.T. is 20·35 less 5 c. = 20·30.
He will therefore demand payment of:—

$$£\frac{3,280}{20\cdot30} = £161\ 11s.\ 7d.$$

Example 31.—A London banker has an order from Madrid to draw cheques upon one of the following centres at the rates indicated, or at best, viz.: Berlin 840, Paris 50·66, Amsterdam 11·68¼, Lisbon 4½d. When he receives these instructions he finds the rates quoted are: Berlin 850–½, Paris 51·16–¼, Amsterdam 11·70½–⅝, Lisbon 4⅛–¼d. Upon which place should he draw in order to comply with his customer's instructions?

Solution :—

All the rates have got worse for selling cheques; i.e., those in foreign currency have risen, whilst that in sterling has fallen. To determine the best rate for the operation, express all rates as proper fractions, and determine which is nearest to unity :—

Berlin	$\frac{840}{850\frac{1}{2}} = \cdot988$
Paris	$\frac{50\cdot66}{51\cdot16\frac{1}{4}} = \cdot990$
Amsterdam	$\frac{11\cdot68\frac{1}{4}}{11\cdot70\frac{5}{8}} = \cdot998$
Lisbon	$\frac{4\frac{1}{8}}{4\frac{1}{2}} = \cdot917$

The rate on Amsterdam has therefore deteriorated least, and the cheques should be drawn on that city.

Example 32.—On 9th February, 1923, exchange on Amsterdam was 11·84½ for £1, London on Paris 74·80 francs for £1. What was the florin value of 100 francs? (*Inst. of Bankers, II*, 1923.)

Solution :—

? florins = 100 francs.
74·80 francs = £1.
£1 = 11·84½ florins

$$= \frac{100 \times 11 \cdot 845}{74 \cdot 80}$$

= 15·83½ florins.

Example 33.—Gold in London is quoted in shillings and pence per ounce fine. In 1923, the price was called the " American Parity " price, i.e., it was based on the rate of exchange for £1 gold in New York. Calculate the price of gold in London with exchange $4·68½ ($1 = 23·22 grains gold; 1 oz. = 480 grains gold). (*Inst. of Bankers, II*, 1923.)

Solution :—

? £ = 480 grains fine gold.
23·22 grains = $1.
$4·685 = £1.

$$= \frac{480}{23 \cdot 22 \times 4 \cdot 685}$$

∴ Price per oz. = £4·412
= 88s. 3d. per oz.

Example 34.—The American dollar originally had a gold content of 25·8 grains, $\frac{9}{10}$ths fine, but by decree it has been reduced to 59·06 per cent. of its original value. If the rate of exchange between London and New York is $4·95 = £1, calculate the price of gold in London based on the American parity (1 oz. troy = 480 grains).

If the price of gold in London is actually 142s. per fine ounce, at what premium or discount does it stand in relation to the American parity?

Solution :—

? £ = 1 fine ounce.
If 1 oz. = 480 grs.
9 grs. fine = 10 grs. standard.
258 grs. standard = $10 (old).
$59·06 (old) = $100 (new).
$4·95 = £1.

$$\frac{480 \times 10 \times 100}{9 \times 258 \times 59 \cdot 06 \times 4 \cdot 95}$$

= £7·071, or 141s. 5d. per fine ounce.

Actual price of gold is 142s., i.e.,

Price is at a premium of 7d. over the American parity.

Example 35.—From the following data calculate what rate should be given in New York for a 60 days' commercial bill on London for £120 15s. Demand rate $4·68½, London Bank rate 3 %, Stamp duty $\frac{1}{20}$ per cent. (*Inst. of Bankers, II*, 1923.)

Solution :—

Demand rate = \$4·685
Less 63 days' int. at 3 % = ·02426
(London terms)
Stamp duty $\frac{1}{2}\frac{1}{6}$ % = ·00234
·0266
Rate for 60 days' bill = \$4·6584
Say, \$4·65$\frac{3}{3}\frac{7}{2}$.

NOTE.—Three days' grace must be allowed. The amount of the bill need not enter into the calculation of the rate.

Example 36.—The New York rate on Paris is quoted in dollars and cents per 100 francs. If exchange London on Paris be 92·80 and London on New York 4·25¼, what will be the arbitrated rate between New York and Paris in cents per franc? (*Inst. of Bankers, II*, 1924.)

Solution :—

If London on Paris is Fcs. 92·80 to £1, and London on New York is \$4·25¼ to £1, then New York on Paris in cents to 1 franc will be :—

? c. = Fr. 1.
Fcs. 92·80 = £1.
£1 = \$4·25¼.
\$1 = 100 c.

$$= \frac{4{\cdot}2525 \times 100}{92{\cdot}80}$$

= 4·58 cents per franc.

Example 37.—A banker in London purchases an exporter's bill for \$10,000 drawn on Buenos Aires at 42⅛d. He sends the bill to Buenos Aires with instructions to his correspondent to present for payment and remit the proceeds by T.T. to London less charges. Show (1) the sterling amount paid in London for the bill, and (2) the amount of the proceeds ultimately received in London from Buenos Aires in sterling. The T.T. rate at which the correspondent remits is 42¼d. Argentine stamp duty ½ °/₀₀; correspondent's commission ¼ %. (*Inst. of Bankers, II*, 1924.)

Solution :—

The bill will be drawn payable in *paper* pesos, so the exchange rate will be $\frac{44}{100} \times 42{\cdot}125$.

∴ Sterling amount paid in London

$$= \frac{44}{100} \times 42{\cdot}125 \times \frac{10{,}000}{240}$$

= £772 5s. 10d.

Net proceeds received in Buenos Aires

Less stamp duty ½°/₀₀ = \$5
Agent's commission ¼ % = \$25
\$30

= \$10,000 — \$30 = \$9,970.

The sterling proceeds received in London are therefore \$9,970 at 42¼d. $\times \frac{44}{100}$ per \$.

$$= £\frac{4,225}{240} \times \frac{44}{100} \times 9,970$$
$$= \underline{£772\ 5s.\ 2d.}$$

Example 38.—A customer offers you a sight draft drawn on a New York bank and asks for a draft on Milan for lire 124,774·88 in exchange. The rates current are: New York T.T. 4·85–⅛, New York cheque 4·85½–¾, Italy cheque 121½–¾. Calculate how many dollars you would require. Allow a profit for yourself of ⅛ cent in the New York rate and ¼ lira in the Italian rate. (*Inst. of Bankers, I*, 1926.)

Solution :—

The Milan draft is sold at the cheque rate, 121½, *less* commission ¼ lira, i.e., at 121¼, yielding in sterling

$$£\frac{124,774 \cdot 88}{121 \cdot 25}$$

For this amount the customer must give a dollar draft at the New York *cheque* rate 4·85¾, *plus* the bank's commission of ⅛ c., i.e., at 4·85⅞.

$$\therefore \text{ Amount of draft in dollars} = \frac{124,774 \cdot 88 \times 4 \cdot 85875}{121 \cdot 25}$$
$$= \underline{\$5,000.}$$

NOTE.—In both transactions, the rule "Buy high, sell low" applies, so the bank's commission is deducted in *selling* lira, and is *added* in *buying* dollars.

Example 39.—A client places £754 13s. 11d. with his London bankers, with instructions to remit the equivalent by mail to Capetown. At the time exchange on that city was quoted ⅛ % premium for mail transfers. Subsequently it was found that the funds were not required in South Africa and the remittance was returned telegraphically. At this time telegraphic remittances South Africa to London were quoted ½ % premium. What would be the net amount received back by the original remitter? (*Inst. of Bankers, I*, 1926.)

Solution :—

If exchange on Capetown is at ⅛ % premium,

£100⅛ in London purchases £100 in Capetown.

$$\therefore \text{ £754·69583 in London purchases } \frac{100 \times 754 \cdot 69583}{100 \cdot 125}$$

If South Africa quotes London at ½ % premium,

£100½ in South Africa purchases £100 in London.

$$\therefore £\frac{100 \times 754 \cdot 69583}{100 \cdot 125} \text{ in South Africa purchases } \frac{£100}{100 \cdot 5} \times \frac{100 \times 754 \cdot 69583}{100 \cdot 125} \text{ in London}$$
$$= £750 \cdot 004$$
$$\text{Say, } \underline{£750.}$$

Example 40.—An exporter in this country draws a 90 d/s bill for £1,000 on an importer in New Zealand. He enfaces the bill with the clause "Payable with exchange and stamps for negotiating bills on the Colonies as per endorsement" and asks his banker in London (a New Zealand bank) to negotiate it. Allowing for New Zealand stamps at 2s. per cent., calculate: (*a*) the amount received by the exporter; (*b*) the amount to be collected from the importer. The rate quoted for the purchase of 90 d/s bills on New Zealand is 127⅞.

Solution :—

(*a*) Banker's buying rate will be endorsed on the bill, and stamps will be collected from the drawee.
Hence, the customer will receive £1,000.

(*b*) The rate endorsed will be New Zealand £127⅞ = £100 English.
∴ The bill will be converted as follows:—

	£	s.	d.
£$\frac{1{,}000}{1} \times \frac{127{\cdot}875}{100}$	1,278	15	0
Add Stamps, 1 ‰	1	6	0 *
Amount to be collected from drawee ..	£1,280	1	0

* NOTE.—It is important to remember that on "exchange as per endorsement" bills the stamp duty in the foreign country will be calculated on the amount of the bill when converted into the foreign currency, in this case £1,278 N.Z.

Example 41.—If American currency be at a premium of ¼ % in Montreal, calculate (*a*) the rate, (*b*) the amount, a Canadian banker would pay for a 60 days' sight bill on London for £5,000. New York demand rate on London is $4·84½–¾, London discount rate 5 %, and profit to be made for the Montreal banker ¼ % (include stamp duty). (*Inst. of Bankers, II*, 1927.)

Solution :—

(*a*) $100¼ in Montreal will buy $100 in New York.

New York demand rate on London (buying) .. .. = 4·845

∴ Canadian demand rate on London = $\frac{4{\cdot}845 \times 100{\cdot}25}{100}$

= $4·8571

Less Interest for 63 days at 5 %	= ·0419	
Profit at ¼ %	= ·0121	
English stamp duty, say, ½ ‰	= ·0024	
		·0564
		$4·8007

Say, $4·80 per £1.

(*b*) ∴ Amount paid for bill = $4·80 × 5,000
= $24,000.

Example 42.—Given a spot rate of exchange, London on Paris, of 120½, calculate the probable three months' forward rate of exchange. (Rate of interest in London is 5 % and in Paris 7½ %.) (*Inst. of Bankers, II*, 1927.)

Solution :—

London interest rate, 5 % per annum.
Paris interest rate, $7\frac{1}{2}$ % per annum.
∴ Money earns $2\frac{1}{2}$ % per annum more in Paris than in London.
∴ The three months' forward rate should be at a discount of approx. $\frac{5}{8}$ %

$$\therefore \text{Three months' forward rate} = \frac{120 \cdot 5 \times 100 \cdot 625}{100}$$
$$= 121 \cdot 253125$$
$$= 121 \cdot 25 \text{ fcs. per £1, or}$$
$$\underline{\text{75 cents over spot.}}$$

Example 43.—On 1st February, 1927, an American banker sends the following telegram to his London correspondent:—

" Against dollars I am a buyer of lire 500,000; limit 4·28."

When the wire was received, the London quotation for lire was 114–$\frac{1}{2}$, while dollars were quoted \$4·84$\frac{3}{4}$–·85.

On the assumption that the London banker executes the order, what would be the profit or loss on the transaction? (*Inst. of Bankers, II*, 1927.)

Solution :—

If the London banker executes the order at the limit specified, i.e., \$4·28 per 100 lire, he receives for 500,000 lire

$$\$\frac{500{,}000 \times 4 \cdot 28}{100} = \$21{,}400$$

	£	s.	d.
These dollars he sells in London for $£\frac{21{,}400}{4 \cdot 85}$ .. .. =	4,412	7	5
He covers his sale of lire by purchase of 500,000 lire			
at 114, costing $£\frac{500{,}000}{114}$ .. .. =	4,385	19	4
∴ Profit (excluding brokerage and cables) .. .. =	£26	8	1

Example 44.—You receive from a foreign correspondent a three months' sight bill drawn on a London firm. The instructions are to present it for acceptance, and, when accepted, to get the bill discounted on the London market, the proceeds to be placed to the credit of your correspondent.

The bill is for £100 13s. 4d. The discount rate in London is $5\frac{1}{2}$ %.

Show the amount with which you would ultimately credit your correspondent. (Days of grace and stamp duty to be taken into account.) (*Inst. of Bankers, II*, 1927.)

Solution :—

It may be assumed that the bill has 95 days to run when discounted.

	£	s.	d.	£	s.	d.
Amount of bill				100	13	4
∴ Discount = $£\frac{100 \cdot 667 \times 95 \times 11}{365 \times 200}$ = £1·441 =	1	8	10			
Stamp		2	0			
				1	10	10
∴ Total net proceeds .. .. =				£99	2	6

Example 45.—If English currency exchanges for Egyptian currency at the rate of £1 sterling for 19s. 9d. Egyptian, what rate of exchange does this represent? Express the rate as a premium or discount.

Solution :—

Egyptian currency is quoted as so many piastres per £1 sterling, 100 piastres being equivalent to £1 Egyptian.

Hence:—

? Piastres = £1 sterling.
If £1 sterling = 19s. 9d. E.
£1 E. = 100 piastres.

$$= \frac{100 \times \cdot 9875}{1}$$

= 98·75 Pi. per £1, or

A discount of 1¼ per cent.

Example 46.—A London merchant invested £10,000 in lire in 1913, and sold them in 1928. Assuming that the purchase and sale took place at rates approximating to the pars of exchange ruling at these times, how much do you estimate would be the capital loss on the transaction? (*Inst. of Bankers, I*, 1928.)

Solution :—

Mint Par between England and Italy in 1913, 25·2215 lire per £1.
Mint Par between England and Italy in 1928, 92·46 lire per £1.
£10,000 at lire 25·2215 per £ = Lire 252,215
Lire 252,215 at lire 92·46 per £ = £2,727 8s.
Say, £2,728.
∴ Capital loss = £10,000 — £2,728.
= £7,272 (approx.).

Example 47.—A British merchant exports goods to New York to the value of $10,000, and receives in payment a three months' acceptance for that amount. To realise sterling he can either sell the bill now at 4·94⅛, or he can sell the currency for delivery in three months' time at a forward exchange rate of 4·86¾. Which method would you adopt? Show your arithmetical working, allowing for sterling being worth 5 % per annum. (*Inst. of Bankers, I*, 1928.)

Solution :—

Net proceeds if bill is sold immediately .. $= £\frac{10{,}000}{4 \cdot 94125} = £2{,}023 \cdot 779$
Interest on this sum at 5 % .. .. = 25·297
∴ Total proceeds .. .. = £2,049·076

$10,000 sold forward at $4·86¾ realise $£\frac{10{,}000}{4 \cdot 8675}$ = £2,054·443

It is therefore better for the merchant to sell the dollars forward, as he thereby realises £5 7s. 4d. more than if he had discounted the bill immediately.

Example 48.—You are asked to buy a demand bill for $487,535·02 drawn on Montreal. The rate of exchange for sight drafts is $4·88–¼, and your charge is, say, ⅛ % commission. What will be the sterling amount with which you credit your customer's account? (*Inst. of Bankers, II*, 1928.)

Solution :—

$$\$487,535\cdot02 \text{ at } \$4\cdot88\tfrac{1}{4} \text{ realise } £\frac{487,535\cdot02}{4\cdot8825} = £99,853\cdot563$$

Less Commission at $\frac{1}{16}$ % .. .. = 62·408

£99,791·155

∴ Sterling amount credited to customer's account is

£99,791 3s. 1d.

Example 49.—An exporter in Milan has the choice of two methods for obtaining payment from the London importer. He can open a London reimbursement credit through his own bank, available for bills at 3 months' date, for which the charge is $\frac{3}{8}$ per cent. The discount rate in London for fine bank bills is 2 per cent., whilst the exporter's bank will allow for a collection commission of $\frac{1}{8}$ per cent. in the rate at which it will negotiate bills under the credit.

Alternatively, the exporter can take payment in the form of a sterling T.T. to be remitted by the importer in 3 months. His bank quotes a forward rate of 10 c. discount for the sterling, as compared with the spot rate of lire 63·45.

Which method is the better for the Italian exporter, if his funds are worth 4 per cent. p.a. to him in Italy? (Ignore Italian stamp duty.)

Solution :—

(1) Spot rate at which bank will buy T.T.			Lire 63·45
Deduct Discount at 2 % for 3 months		·3172	
Commission, $\frac{1}{8}$ %		·0793	
Stamp duty, $\frac{1}{2}$ ‰		·0317	
			·4282
			Lire 63·0218
Long rate will probably be			Lire 63·02
Deduct Cost of credit, $\frac{3}{8}$ %			·24
Ultimate rate at which exporter will realise his sterling ..			Lire 62·78
(2) Forward rate at which bank will buy T.T.			Lire 63·35
Deduct Loss of interest in Italy at 4 % for 3 months ..			·6335
Ultimate rate at which exporter will realise his sterling ..			Lire 62·7165

It will be seen that he realises more lire for each £1 by the first method than by the second.

Hence the first method is the better.

Example 50.—A German export house is desirous of making arrangements for a series of shipments to South America. The importer's agent offers payment in London, and, on enquiry, the exporter, who is prepared to extend and pay for three months' credit to his customer, finds the following methods open to him:

(*a*) He can ask the importer to arrange for a Documentary Credit in London available for the acceptance of the exporter's three months' bills on the London bank. In this case, acceptance commission in London is $\frac{3}{8}$ % and credit charges in South America $\frac{1}{8}$ % on the face amount of the drawings. Such an acceptance can be discounted at the market rate for fine bank paper of $2\frac{3}{4}$ %.

(*b*) He can draw a bill on his customer direct, the customer domiciling it in London. In this case the paying agent charges $\frac{1}{8}$ % commission, and the market for domiciles is very poor, the cheapest buyer being at $4\frac{1}{2}$ % per annum.

(c) He can draw a bill on his customer direct, payable in sterling, and these bills can be negotiated in Berlin at an inclusive rate of Rms. 14·20 per £1, the current cheque rate being 14·37½.

Which arrangement is the cheapest?

Solution :—

(*a*) The cost per annum of a *three months' credit* will be

$(\frac{3}{8} + \frac{1}{8}) \times 4$	=	2 % per annum.
Plus cost per annum of discounting bank bills ..	=	$2\frac{3}{4}$ % ,, ,,
Total	=	$4\frac{3}{4}$ % per annum.

(*b*) The *three months' domicile* commission will be $\frac{1}{8}$ %, or $\frac{1}{2}$ % per annum.

The discount charges are	=	$4\frac{1}{2}$ % ,, ,,
Total	=	5 % per annum.

(c) He can deal in the bill by selling it in Berlin for Rm. 14·20 per £1. This is 17½ pfennige worse on a three months' bill, or, yearly, a charge of 70 pfennige on the short rate of 14·37½.

Hence on 14·37½ reichsmarks charge is .. Rmks. 0·7

$$\therefore \text{ On 100 reichsmarks charge is } \quad \frac{\cdot 7 \times 100}{14 \cdot 37\frac{1}{2}}$$

say, $4\frac{7}{8}$ % per annum.

The exporter's cheapest method is therefore to ask the importer to arrange a documentary acceptance credit with a London banker.

Example 51.—Owing to exchange restrictions abroad, exporters often have difficulty in repatriating funds to this country. An exporter in London draws a bill on Hungary at sight for £329 15s. 11d. The bill is duly presented, but, owing to local laws, paid in pengöes at the rate of 29 per £1. These pengöes are placed on a " blocked " account and the exporter requests his bank to sell at best, when possible. Later, a buyer of pengöes appears wishing to import goods from Hungary, and for this purpose the pengöes will be released. The rate he is willing to pay for the " Inland Pengöes ", as these are called, is 31¼. Ascertain the exporter's exchange loss.

Solution :—

Proceeds of the bill in pengöes = 329·796 × 29
= Pengöes 9,564·08

Proceeds of sale of Pengöes 9,564·08 @ 31·25
= £306 1s. 0d.

∴ Loss to exporter = £329 15s. 11d., *minus* £306 1s. 0d.
= £23 14s. 11d.

Example 52.—You have bought from a customer " about " Pes. 60,000 for delivery end October at 39⅞. On the 2nd November you are advised by your Madrid correspondent that Pes. 60,395·50 have been credited to your " blocked " peseta account, and that an official permit for their release has been applied for. At that date there is a discount on forward pesetas of ¼ per month. If the amount on the blocked account is released on 30th November, with what amount will the customer be credited?

Solution :—

On 30th November the banker is short of about 60,000 Pes. as a result of the non-delivery of free currency.

He therefore buys in the pesetas at the ruling spot rate and sells them one month forward at a difference of $\frac{1}{4}$, hoping that the blocked account will be freed by the end of the month. His anticipation turns out to be correct, but he has lost $\frac{1}{4}$ in the rate on the swap and will therefore charge this up to the customer by adjusting his rate to $40\frac{1}{8}$ (i.e., $39\frac{7}{8}$ *plus* $\frac{1}{4}$). The customer would therefore be credited with

$$£\frac{60{,}395 \cdot 40}{40\frac{1}{8}} = \underline{£1{,}505\ 3s.\ 7d.}$$

Example 53.—A bank requires to buy 200,000 ounces standard silver for use in two months' time. The spot price is $18\frac{7}{32}$d. per ounce, and the forward price is $18\frac{11}{32}$d. per ounce. The bank can invest its money at 3 % for the two months and accept the forward rate, or it can buy the silver at once at the spot price. In the latter case, half the silver, owing to lack of storage space, will have to be stored elsewhere at a charge of 3d. per 1,000 ounces per month and an insurance premium of £1 5s. Which course should the bank adopt?

Solution :—

(*a*) Cost by Buying Spot:

	£	s.	d.
200,000 ounces × $18\frac{7}{32}$d.	15,182	5	10
Storage on 100,000 ounces	1	5	0
Insurance	1	5	0
Interest lost, 2 months at 3 %	75	18	3
	£15,260	14	1

(*b*) Buying Forward:

200,000 @ $18\frac{11}{32}$ = £15,286 9s. 2d.

It will therefore be cheaper to buy spot silver and store it.

Example 54.—A merchant banker agrees to buy from a customer 1,000 sovereigns at 25s. 6d. each. He can sell gold at 110s. per ounce fine. A sovereign contains 113·0016 grains of pure gold and 480 grains equal one ounce. Find his profit, ignoring the cost of melting down.

Solution :—

$$1 \text{ sovereign} = \frac{113 \cdot 0016}{480} \text{ ounces}$$

Therefore the amount of pure gold in 1 sovereign can be sold for

$$\frac{113 \cdot 0016 \times 110}{480} \text{ shillings}$$
$$= 25 \cdot 8962 \text{ shillings.}$$

Therefore 1,000 sovereigns can be sold for 25,896·2 shillings.
But the banker pays for them

$$1{,}000 \times 25s.\ 6d. = 25{,}500 \text{ shillings}$$
$$\therefore \text{ Banker's profit} = \underline{396 \cdot 2 \text{ shillings}}$$
$$= \underline{£19\ 16s.\ 2d.}$$

Example 55.—A banker buys Turkish lira in Baghdad, at the rate of 8⅜ paper lira for each gold lira. The current price for sterling is 680 (piastres per £1). The following is the bullion statement from the refiners for 3,000 coins. Complete the calculations, and from this, assuming the banker sells the sterling at the current rate quoted, find his profit, in Turkish paper, ignoring freight or other charges not given in this qestion.

Weight after Melting (including Pot Scrapings). Ounces.	*Assay Report.* Fine Gold. Ounces.	Fine Silver. Ounces.
689·55	631·628	11·03

Gold, 631·628 ounces, sold at 124s. 3d. per ounce		£	
Silver, 11·03 ounces, sold at 19⅝d. per ounce		£	
Cost of assay	4 0		
Melting and refining	£5 14 11		
		£5 18 11	
Net proceeds of gold coins		£	

Solution :—

	£	s.	d.
The gold will realise	3,923	19	9
The silver will realise		18	0
	£3,924	17	9
Less charges	5	18	11
Net proceeds of gold coin	£3,918	18	10

£3,918 18s. 10d. at 680
= Piastres 2,664,880·56 or £T.26,648·81 (paper)
Cost of £T.3,000 gold at 8⅜ = £T.25,125 (paper).
Profit: £T. (paper) 1,523·81.

Example 56.—Egypt is sometimes quoted at a single rate and sometimes at par (which is £E.97½ = £100 sterling), *plus* or *minus* a percentage.

A client tenders you for negotiation a cheque on Cairo for £E.1,000. Having no nostro account in Egypt, you ring up two banks operating in that country and are offered 97¾ by one and par (97½) *plus* ¼% by the other. Which rate would you accept?

Solution :—

$$\text{Par} + \tfrac{1}{4}\% = 97\tfrac{1}{2} + \frac{97\tfrac{1}{2} \times \tfrac{1}{4}}{100}$$
$$= 97\tfrac{1}{2} + \cdot 24375$$
$$= 97 \cdot 74375.$$

The second rate should therefore be accepted.

Example 57.—You have $12,000 in notes in your foreign money till and decide that, as you do not need a running balance of more than $2,000, you will dispose of $10,000 of them. A foreign note dealer offers to buy them at 3·40; or, alternatively, you can ship the notes to New York and sell cheque against them. On the market spot dollars are quoted 3·39¼–½, the cheque margin is $\frac{3}{16}$ths of a cent, the insurance on notes from London to New York is 9d. % and the postage on the parcel 5s. Which will be the most remunerative course?

Solution :—

(*a*) If the notes are sold to the dealer, the proceeds are :—

$$£\frac{10{,}000}{3\cdot40} = £2{,}941\ 3s.\ 6d.$$

(*b*) If the notes are remitted to New York, you will sell cheque against them at $3\cdot39\frac{1}{2}$ (the market will pay you only at the higher rate) *plus* $\frac{3}{16}$ c. = $3\cdot39\frac{11}{16}$ths.

			£	s.	d.
Proceeds of $10,000 @ $3\cdot39\frac{11}{16}$	..	..	..	= 2,943	17 8
Less Insurance @ 9d. % ..	..	= 1	2 1		
Postage ..	..	..	=	5 0	
				1	7 1
				£2,942	10 7

The best course is therefore to sell cheque against remittance of the notes to New York.

Example 58.—The exchanges between a country whose currency has depreciated and those of the various gold standard countries tend to show approximately an equal discount on the mint parity, any disparity being rapidly removed by arbitrage operations.

Ascertain the approximate rate of exchange between London and Switzerland, given that the rate of exchange on Paris is $83\cdot83\frac{3}{4}$ to £1. What is the percentage discount on sterling in terms of gold standard currencies ?

Solution :—

$$\text{Sterling is worth only } \frac{83\cdot8375}{124\cdot2134} \text{ of its par value,}$$

$$\text{i.e., } \frac{83\cdot8375}{124\cdot2134} \times 100\,\% \text{ of its par value}$$

$$= 67\cdot49\frac{1}{2}\,\% \text{ (approx.).}$$

$$\therefore \underline{\text{Discount on sterling in terms of gold currencies} = 32\cdot50\frac{1}{2}\,\%.}$$

$$\therefore \text{The rate on Switzerland will be approximately } \frac{67\cdot495}{100} \times \frac{25\cdot2215}{1}$$

$$= \underline{\text{Fcs. } 17\cdot02\frac{1}{4}.}$$

Example 59.—A London banker finds that certain exchange operations will result in his account in New York being overdrawn for eight days. He would be charged overdraft interest at the rate of $4\frac{1}{2}$ % per annum or he can buy T.T. and sell cheque New York at $\frac{3}{8}$ c. discount on a spot rate of $\$4\cdot87\frac{1}{2}$. Assuming that the cheque would not be presented for 8 days, when his account will be in credit, which would be the cheaper form of temporary cover ?

Solution :—

Interest charged per £1 on overdraft for 8 days in New York at New York terms

$$= \$\frac{4\cdot875 \times 9 \times 8}{360 \times 2 \times 100} = \underline{\cdot4875 \text{ c.}}$$

$$\text{Discount per £1 on sale of cheque} = \tfrac{3}{8} \text{ c.} = \underline{\cdot375 \text{ c.}}$$

It is therefore cheaper for the London banker to buy T.T. and sell cheque than to overdraw his account in New York.

Example **60.—A bank receives from a French correspondent the following telegram:—**

> **" Value Friday sell 550,000 francs against three months sixty centimes our favour."**

Explain the operation.

Solution :—

The request contained in the telegram given is that the London bank should carry out a spot against forward operation for the French bank. The London bank will have to sell 550,000 francs on the London, or any other market, " value", i.e., for payment here and there, on the following Friday, and against this sale will have to purchase 550,000 francs for future delivery in three months' time at a price which will be more favourable for its French customer by 60 centimes per £. That is to say, if the sale of spot francs is effected at the rate of 123·85 francs per £, the purchase of the forward francs must be made at a minimum price of 124·45 francs per £. In respect of the spot sale the French bank will credit its London agent with the francs on the same day that it receives credit for the sterling equivalent, i.e., on the following Friday, while in respect of the forward purchase, the London bank will debit the sterling account of the French bank in three months' time on the same day that it gives instructions for the francs to be paid over to the French bank. The London bank will, of course, endeavour to obtain *more* than 60 centimes per £ in its favour for the three months' spread as, if it can obtain, say, 65 centimes, the extra five centimes will constitute its profit.

Example **61.—Ascertain the Central Bank's position in reichsmarks, given the following details:—**

Balance at Deutsche Bank	**Rmks. 100,000 (in credit)**
Balance at Dresdner Bank	**14,000 (overdrawn)**
Total Forward purchases outstanding ..	**4,491,000**
Total Forward sales outstanding	**5,026,000**
Bills on Berlin held, not yet due	**460,000**

Foreign Branch summary of small deals not yet recorded by the dealers (being too small in themselves to be separately recorded):—

Drafts, etc., sold	**Rmks. 7,000**
Cheques, coupons, etc., bought	**1,000**

Solution :—

Spot balances (net)			**Rmks.**	**86,000**
***Add* Purchases:**	**Forward .. ..**			**4,491,000**
	Bills held			**460,000**
	Sundries			**1,000**
				5,038,000
Sales:	**Forward .. .. ..**	**Rmks. 5,026,000**		
	Sundries	**7,000**		
				5,033,000
Net operating position			**Rmks.**	**5,000**

i.e., the Central Bank has an overbought position of Rmks. 5,000.

In practice, this position would be regarded as " square ", for the value of the reichsmarks is only about £300, and therefore not a dangerous risk.

Example **62.—An exchange dealer finds that his position in New York is as follows:—**

(*a*) He has a credit balance of $100,000 with one agent and a debit balance of $50,000 with another.
(*b*) He has purchased T.T. $1,560,000 and sold T.T. $1,500,000.*
(*c*) He has sold drafts for $245,000 which are still in transit.
(*d*) He has bought drafts for $110,000 which are still in transit.
(*e*) He has bought long bills for $295,000 which have not yet matured.
(*f*) He has the following forward contracts outstanding:—

	Bought. $	Sold. $
1 month	3,562,000	4,129,000
2 months	5,148,000	6,324,000
3 months	2,197,000	3,212,000
	$10,907,000	$13,665,000

* Note that T.T.'s are not deliverable until two days later, by market custom. Hence they do not appear immediately in the spot balances.

From these particulars work out his position and explain what action is called for.

Solution :—

	Bought. $	Sold. $
Spot deals	100,000	50,000
T.T.'s	1,560,000	1,500,000
Drafts outstanding ..	110,000	245,000
Long bills	295,000	—
Forward contracts ..	10,907,000	13,665,000
	$12,972,000	$15,460,000

The dealer is thus *oversold* to the extent of $2,488,000, and should, therefore, buy in, say, $2,500,000 spot to square his position. It will be noticed, however, that it is his forward position that is heavily oversold, and, assuming that he does not desire to have his funds tied up in dollar balances, he might still further improve his position by swapping the $2,500,000 spot he has bought for, say, $500,000 one month, $1,000,000 two months', and $1,000,000 three months' forward. By so doing he squares up each of his forward positions.

In practice, of course, the dealer's actual disposition of spot and forward balances would depend upon many considerations, e.g., usability of the money in the different centres and rates of interest.

Example 63.—Using the figures given in the preceding example, show the dealer's final position after carrying out the suggested operations to square his position.

Solution :—

	Debits. $	Credits. $
Balances (unchanged)	50,000	100,000
T.T.'s sold (further $2,500,000 swapped)	4,000,000	—
T.T.'s purchased (further $2,500,000 bought to cover)	—	4,060,000
Drafts and bills (unchanged)	245,000	405,000
Forward contracts:—		
1 month (further $500,000 bought against spot)..	4,129,000	4,062,000
2 months (further $1,000,000 bought against spot)	6,324,000	6,148,000
3 months (further $1,000,000 bought against spot)	3,212,000	3,197,000
	$17,960,000	$17,972,000

He is now overbought to the extent of $12,000, which he might cover by a spot sale.

Example 64.—Your bank has the offer of a G.M.T. for ten days ahead for $500,000, just at a time when you have actually $350,000 on current account in New York, earning 2 % per annum. The terms of the offer are that the customer will sell G.M.T. at 4·51§ *provided you will* sell him the same amount of dollars by T.T. at 4·51. You decide to do this, but in covering the operation you utilise your available balance abroad, buy $150,000 at 4·51 for T.T. and thus make up the amount required to sell to him.

You have now to get rid of the unwanted $150,000 G.M.T. which you have purchased (for your dollar balance abroad has been accumulated for a pre-arranged purpose, and you are naturally ready to take this back in 10 days' time).

Your sales of G.M.T. are done as follows:—

$100,000 at 4·51½ and the balance, viz., $50,000, at 4·51¾. Allowing brokerages of £2 5s. 0d. in all, what profit does your acceptance of this offer yield? (New York works on 360 days to the year.)

Solution :—

Purchases.	Sales.
(*a*) $500,000 G.M.T. @ 4·51⅝.	(*c*) $500,000 T.T. @ 4·51.
(*b*) $150,000 T.T. @ 4·51.	(*d*) $100,000 G.M.T. @ 4·51½.
	(*e*) $50,000 G.M.T. @ 4·51¾.

Setting off (*b*) against part (*c*) we have:—

		£	s.	d.
(*b*) and (*c*) Proceeds of T.T. (500,000–150,000) @ 4·51 ..	=	77,605	6	5
(*d*) Proceeds of G.M.T. 100,000 @ 4·51½	=	22,148	7	11
(*e*) Proceeds of G.M.T. 50,000 @ 4·51¾	=	11,068	1	4
Total proceeds		£110,821	15	8
Less Cost of $500,000 G.M.T. @ 4·51⅝	=	110,711	6	5
		£110	9	3
Less brokerages	=	2	5	0
Gross Profit		£108	4	3
Less interest lost on $350,000 sold at 4·51 (£77,605), 10 days @ 2 %	=	43	2	3
Net Profit	=	£65	2	0

Example 65.—(*a*) Find the silver exchange constant applicable to the Chinese tael of, say, 579·85 grains, $\frac{9}{10}$ths fine, in terms of British standard silver ·925 fine, per ounce of 480 grains. (Answer to 5 places of decimals and ignore expenses.)

(*b*) Apply this constant to a price of 17⅜d. per ounce standard and thus ascertain the rate of exchange of the tael produced by shipping silver from London to Shanghai. Allow for interest lost in shipment (40 days at 3 %), and other charges totalling 1¼ %. (Nearest ⅛d.)

(*c*) Assuming a shipment of 90,000 standard ounces bought at the above price, the actual charges amounting to £80 10s. 0d. with interest for 35 days only being lost, work out the rate of exchange thus produced.

Solution :—

(*a*)
? Pence = 1 Shanghai tael
If 1 tael = 579·85 grains standard
10 grains standard = 9 grains fine
925 grains fine = 1,000 grains British standard
480 grains = 1 ounce
1 ounce = x pence (price of silver in London)?

$$\therefore \text{1 tael} = \frac{579{\cdot}85 \times 9 \times 1{,}000 \times x}{10 \times 925 \times 480} \text{ pence}$$

$$= 1{\cdot}17537x \text{ pence (where } x \text{ is the price of silver in London)}$$

Silver Constant (ignoring charges) = 1·17537.

(*b*) Constant = 1·17537
Price of Silver = 17·375d. per ounce
∴ Value of tael (ignoring charges) = 1·17537 × 17·375 .. = 20·4221
Add Interest, 40 days @ 3 % .. .. = ·0671
Charges, 1¼ % .. .. = ·2553
20·7445

Rate of exchange = 20¾d. (to nearest ⅛d.).

	£	s.	d.
(*c*) Cost of 90,000 standard ounces @ 17·375d. .. .. =	6,515	12	6
Add Charges .. .. =	80	10	0
Interest, 35 days @ 3 % .. .. =	18	14	11
Total Cost .. .. =	£6,614	17	5

$$90{,}000 \text{ ounces st. (British)} = 90{,}000 \times \frac{925}{1{,}000} \times \frac{1{,}000}{900} \text{ ounces st. China.}$$

$$\text{Tael equivalent} = \frac{90{,}000 \times 925}{900} \times \frac{480}{579 \cdot 85}$$

$$= 76{,}571 \cdot 52 \text{ taels.}$$

∴ Taels 76,571·52 cost £6,614 17s. 5d.

$$\therefore \text{ Rate of exchange} = \frac{6614 \cdot 871 \times 240}{76{,}571 \cdot 52} = 20 \cdot 733\text{d.}$$

(say) 20¾d. (to nearest ⅛d.).

Example 66.—If American currency is at a discount of 6¼–6½ per cent. in Montreal, how much will a Canadian banker pay for a T.T. for American $1,000, if he takes a profit of 10 cents in the rate?

Solution :—

The Canadian banker can cover by selling at 6½ per cent. discount, i.e.,

Can. $93·50 per U.S. $100.

He will therefore quote Can. $93·40 per U.S. $100, and will pay

$$\$\frac{1{,}000}{100} \times \frac{93 \cdot 40}{1}$$

= Can. $934.

Example 67.—An exchange operator purchases 4 % Funding Loan in London to the face value of £50,000 at 90¾ and sells the stock in New York at 91. He employs the proceeds in the purchase of a T.T. on London at the current rate of exchange of 4·85$\frac{25}{32}$. The Wall Street quotation is based on a nominal parity of $5 to the £.

Calculate the operator's profit or loss on the deal. You may ignore brokerages and other charges.

Solution :—

$$\text{Cost of £50,000 Funding Loan @ } 90\tfrac{3}{4} = \frac{50{,}000 \times 90 \cdot 75}{100} = £45{,}375$$

Dollar proceeds of £50,000 Funding Loan at 91

$$= \frac{\$50{,}000 \times 5 \times 91}{100} = \$227{,}500$$

Proceeds of $227,500 @ 4·85$\frac{25}{32}$ .. .. = £46,831·779
∴ Operator's Profit .. .. = £1,456·779

= £1,456 15s. 7d.

Example 68.—The following quotations for exchange on South Africa appeared in the daily Press:—

	Buying Rate.	Selling Rate.
S.A. Union Territory, T.T.s	£67 12 6	£66 12 6
S.A. Union Territory, sight drafts ..	68 2 6	66 13 9

If the South African banks in London charge 9 % per annum for discounting commercial drafts on South Africa, use the above rates to calculate (*a*) the probable rate which would be quoted by the London office of a South African bank for the purchase by it from a Manchester merchant of a 60 d/s commercial bill on Cape Town for £173 12s. 6d., and (*b*) the sterling amount which the merchant would receive if he sold the bill, to the bank, at such a rate. (Allow 1s. S.Af. % for stamp, and take 360 days to the year.) (*Institute of Bankers*, 1933.)

Solution :—

	£
(*a*) Buying rate for sight drafts	68·1
Add Interest @ 9 % for 60 days, $\frac{60}{360} \times \frac{9}{100} \times \frac{68 \cdot 125}{1}$	1·022
Stamp duty, ½ ‰	·034
	£69·181

Buying rate for 60 d/s draft is £69 3s. 9d. (to nearest 6d.).

(*b*) On the basis of this rate a bill for £173 12s. 6d. would be purchased for:—

$$£\frac{173 \cdot 625}{69 \cdot 1875} \times 100 = \text{£250 19s. 0d.}$$

Example 69.—If the mailing period between London and South Africa is taken as 28 days, calculate the rate of interest represented by the spread between the rates quoted in London for the purchase of T.T. and cheque on South Africa, the two rates being £100 15s. and £101 5s. respectively.

Solution :—

The spread is 10s. on a rate of £100 15s., i.e.,

$$\frac{10}{2{,}015} \times \frac{100}{1} \times \frac{365}{28} \text{ per cent. p.a.}$$

$$= 6 \cdot 47 \text{ \% approx.}$$

Say, 6½ % per annum.

Example 70.—An exchange dealer in London, having bought from a customer $15,000 T.T. New York at $3·60½ per £, seeks the best method of covering the operation. If the following are the current market rates how should he cover his purchase of dollars and what is his profit? (Ignore expenses.)

T.T. London on New York	3·60–¼
,, ,, ,, Berlin	14·50–·55
,, ,, ,, Amsterdam	8·71–·72
,, ,, ,, Zurich	18·37–·38
,, Berlin on New York	4·04 marks per $
,, Amsterdam on New York	2·42 Fls. per $
,, Zurich on New York	5·10 Fcs. per $

Solution :—

The dealer must sell \$15,000 at as low a rate as possible.

1. If he sells dollars in London the rate is \$3·60¼.

2. If he sells dollars in Berlin at 4·04 Rm. per \$ and sells the proceeds at 14·55 Rm. per £, the equivalent rate is $\$\frac{14\cdot55}{4\cdot04}$ per £
$= \$3\cdot6015$ per £.

3. If he sells dollars in Amsterdam at 2·42 Fls. per \$ and sells the proceeds at 8·72 Fls. per £, the equivalent rate is $\$\frac{8\cdot72}{2\cdot42}$ per £
$= \$3\cdot603$ per £.

4. If he sells dollars in Zurich at 5·10 Fcs. per \$ and sells the proceeds at 18·38 Fcs. per £, the equivalent rate is $\$\frac{18\cdot38}{5\cdot10}$ per £
$= \$3\cdot604$ per £.

The best centre for the sale of dollars is therefore Berlin.

Sale of \$15,000 @ Rm. 4·04 realises Rm. 15,000 × 4·04
= Rm. 60,600.

	£ s. d.
Sale of Rm. 60,600 @ 14·55 realises $£\frac{60\cdot600}{14\cdot55}$	= 4,164 18 11
Purchase of \$15,000 from customer at \$3·60½ costs $£\frac{15,000}{3\cdot605}$	= 4,160 17 9
The dealer's profit is	£4 1 2

Example 71.—On a given date francs were quoted at Fcs. 124·23–·25 per £1. Some time later the rates were quoted at Fcs. 80¼–80½. Compare the size of the spread in these two rates by expressing each as a per milleage of the middle rate.

Solution :—

When francs are quoted at 124·23–·25, the middle rate is 124·24, whilst the spread is Fcs. ·02,

i.e., a spread of $\frac{\cdot02}{124\cdot24} \times \frac{1,000}{1}$ per mille
$= \cdot16$ per mille.

When francs are quoted at $80\frac{1}{4}$–$\frac{1}{2}$, the middle rate is $80\frac{3}{8}$, whilst the spread is ¼ Fc.,

i.e., a spread of $\frac{\cdot25}{80\cdot375} \times \frac{1,000}{1}$ per mille
$= 3\cdot11$ per mille
$= 3\frac{1}{8}$ per mille (approx.).

I.e., the spread is twenty times greater than in the first instance.

Example 72.—From the following data calculate at what rate a banker, operating with £1,000, could sell American dollars three months' forward. Spot rate, $4·84. Interest in London, 5 %. Interest in New York, 4 %. (*Institute of Bankers*, 1929.)

Solution :—

Assuming that the banker covers his forward sale by buying spot, he bases his forward rate on the spot rate, viz.	4·84
Less loss of interest, 3 months at 1 %	·012
	4·828

say, 4·82¾ for dollars 3 months' forward or 1¼ c. premium.

Example 73.—If, on 30th November, 1931, the T.T. rate, London on New York, was quoted at $3·74–¼ per £, and the forward margins were: 1 month, ½–¼ c. premium; 2 months, 1–¾ c. premium; and 3 months, 1½–1¼ c. premium, and a London banker was prepared to deal with his customers at these rates, what rates would he have quoted to a customer who required the sale to him of:—

(*a*) $20,000 for delivery 31st January, 1932;
(*b*) $20,000 for delivery during December, 1931, at his option;
(*c*) $20,000 for delivery during December, 1931–January, 1932, at his option;
(*d*) $20,000 for delivery during January, 1932, at his option?

Assuming that the customer accepts the quotation for (*b*), with how much sterling would he be charged on completion of the contract and on what date would this take place if he took full advantage of his option?

Solution :—

(*a*) 3·74 less ·01 = 3·73.
(*b*) 3·74 less ·005 = 3·73½. (This is more favourable to the banker than 3·74 for spot.)
(*c*) 3·74 less ·01 = 3·73. (This is more favourable than 3·735 for December 31st.)
(*d*) 3·74 less ·01 = 3·73. (This is more favourable than 3·735 for December 31st.)

Cost of $20,000 at 3·73½ = £5,354 15s. 1d.

The customer would take delivery on 31st December, as he has been charged the premium of ½ cent on the assumption that he will take full advantage of his privilege to delay completion for a full month.

Example 74.—A customer hands you for collection on the 1st May a bill for £1,000 on Rio de Janeiro claused "Payable at collecting banker's selling rate for 90 d/s draft on London". You agree to advance him £500 against the bill, and the advance is made on the same day (1st May) at 5½ per cent. On 12th August the return remittance is received from Rio de Janeiro, together with a debit note for Milreis 50 in respect of stamps and other expenses. The return remittance is accepted on 13th August and is discounted the following day at 3 per cent. Calculate the amount to be credited to the customer. The milreis may be converted at 3⅛d.

Solution :—

Return remittance falls due on 14th November.
It is discounted on 14th August.

	£	s.	d.	£	s.	d.
Hence, from face value				1,000	0	0
Deduct Discount at 3 % for 92 days ..	7	11	3			
Stamps, ½ ‰		10	0			
				8	1	3
Net Proceeds				£991	18	9

	£	s.	d.	£	s.	d.
Amount of advance to customer				500	0	0
Add Interest from 1st May to 14th Aug., viz., 105 days at 5½ % ..	7	18	3			
Expenses, Mil. 50 @ 3⅛d. ..		13	1			
				8	11	4
				508	11	4
Amount due to customer				£483	7	5

Example 75.—A New York dealer is willing to sell T.T. on London at $4·95 and to sell cheque at $4·94½. Allowing for a mailing period of 9 days, calculate the interest rate represented by the spread between the two rates.

Solution :—

The " spread " between cheque and T.T. amounts to $·005 (i.e., ½ cent) on $4·95.

This is equivalent to $\frac{·005}{4·95} \times \frac{100}{9} \times \frac{365}{1}$ per cent. p.a.

$= 4·0965$ %.

Say, $4\frac{3}{32}$ % per annum.

Example 76.—A customer hands his banker for collection a draft for £400 on Paris, which is expressed to be payable by a sight draft on London. The banker sends the draft to his Paris agent, who stamps the bill, presents it to the drawee and obtains payment.

If the Paris banker was a dealer in cheque on London at 80·45–·50 at the date of presentation, and if French stamp duty is ½ per mille, calculate the amount with which the London banker will credit his customer on receipt of the proceeds from Paris. Allow the London banker a commission of 1 per mille.

Solution :—

The French banker would demand payment at his selling rate, viz., 80·50, and would therefore receive Fcs. 400 × 80·50 = Fcs. 32,200 from the drawee.

He will credit the London banker with £400 and debit him with Fcs. 16·10 for stamp duty. He charges no collecting commission, as he takes his profit in the rate at which he collects.

	s.	d.	£	s.	d.
London banker will credit customer with ..			400	0	0
Less Commission, 1 ‰	8	0			
Stamp duty, Fcs. 16·10 @ say 80	4	0			
				12	0
Amount credited to customer			£399	8	0

Example 77.—A banker in Norway buys a bill on London (due 18th November) for £1,519 13s. 6d. at Kr. 18·16 = £1. He remits it to London, discounts it on 2nd September at 1¼ per cent., and sells the proceeds by T.T. at Kr. 18·22 = £1. Calculate his profit.

Solution :—

Cost of bill = Kr. 18·16 × 1,519·675
= Kr. 27,597·29.

	£ s. d.	£ s. d.
Proceeds of bill	=	1,519 13 6
Less Discount, 77 days @ 1¼ %	= 4 0 2	
Stamps, 1s. %	= 16 0	
		4 16 2
		£1,514 17 4

£1,514 17s. 4d. at Kr. 18·22 realise .. Kr. 27,600·87
Deduct Outlay .. .. 27,597·29
Banker's Profit Kr. 3·58

APPENDIX

Abbreviations used in Exchange and Banking

A.	Anna (Indian coinage)
@	At; for; to; from
A.A.R.	Against all risks
A/C	Account Current
a/c *or* **acct.**	Account
Acc.	Acceptance, accepted
Acct.	Accountant
Ackgt.	Acknowledgment
A.D.	Anno Domini (In the year of our Lord)
a.d. *or* **a/d**	After date
Adv.	Advice
Ad val.	Ad valorem
Agt.	Agent
Agst.	Against
Amt.	Amount
Ans.	Answer
A/o	Account of
A/or	And, or
A.P.	*à protester* (to be protested —bills)
Approx.	Approximate
A/S	Account Sales
a/s	At sight, after sight
as.	Annas
Av.	Average
Av. *or* **Avoir.**	Avoirdupois
A/v	Ad valorem (according to value)
Bal.	Balance
B.B.	Bill Book
B.C.	Bills for Collection
B/D	Bank Draft; Bill Discounted
B.Dt.	Bill Discounted
B/E	Bill of Exchange
B. of E.	Bank of England
B/f	Brought forward
Bk.	Bank; Book
Bkg.	Banking
Bkpt.	Bankrupt
B/L	Bill of Lading
B.N.	Bank Note
B/N	Bill Negotiated
B.O.	Branch office; Buyer's option
Bona fide	In good faith
Bot.	Bought
B/P	Bill Payable
B.P.B.	Bank Post Bill
B/R	Bill Receivable
Brit.	British
B.S.	Balance Sheet
B/S	Bill of Sale
C/-	Currency; coupon
c.	Cent; cents; centime; centavo; copeck
C/A	Capital Account
C.A.	Chartered Accountant
Cap.	Capital; Capitulum (Chapter)
Cash.	Cashier
C.B.	Cash Book
C. and D.	Collection and Delivery
C/d	Carried down
C.d.	Cum dividendo (with dividend)
C. and F.	Cost and Freight
Cent.	Centum (100); Centimo; Centigrade; Centavo
Cert.	Certificate or Certified
C/f	Carried forward
Cert. Inv.	Certified Invoice
C.H.	Custom House; Clearing House
Ch.	Chapter
Ch. fwd.	Charges forward
Chq.	Cheque
C.I.F.	Cost, Insurance and Freight
Cml.	Commercial
C/N	Credit Note; Consignment Note; Circular Note

Co. Company; County
C.O. *Compte ouvert* (open account)
C/O Cash Order (banking)
c/o Care of; carried over
C.O.D. Cash on Delivery
Com. Commercial; Commission
Con. Contra (against)
Con. cr. Contra credit
Con. inv. Consular invoice
Cont. Contract; Continent
Contra Against
Coy. Company
C/P Charter Party; Custom of Ports
Cr. Credit; Creditor
ct. Cent; credit; current
cts. Cents
Cum d/- (*or* **div.**) With dividend
Curt. Current
C.W.O. Cash with order
Cwt. Hundredweight
Cy. Currency

D. Denarii (pence): 500
D/A Days after Acceptance; Documents Against Acceptance; Deposit Account
D.B. Day Book
D/C Deviation Clause
D/D Demand Draft
d/d Days after date; Days' date
Deb. Debenture
Dept. Department
Dft. Draft
Dis. Discount
Div. Dividend; Division
D/N Debit Note; Delivery Note
D/O Delivery Order
Dols. Dollars
D/P Documents against Payment
Dr. Debtor; Drawer
D/R Deposit Receipt (banking)
d/s Days' sight
D/W Dock Warrant
Dwt. Pennyweight
Dy., D/y, Dely. Delivery

E. and O.E. Errors and Omissions Excepted
e.d. Ex Dividend
E.E. Errors Excepted
E/I Endorsement Irregular
Eng. England
Eq. Equivalent
Ex. Exchange
Exch. Exchange; Exchequer
Ex cp. Ex coupon
Ex div. Without dividend
Ex In. Without Interest
Ex n. Ex new (without the right to new shares)
Exs. Expenses

f.a.s. Free alongside ship
Fb Francs belges, i.e., Belgian francs
f, fc. Franc
Fcs. (fcs.) Francs
F.G.A. Foreign general average
Fig. Figure
Fl. Florin(s)
Fo; Fol. Folio
F.O.B. Free on board
f.o.c. Free of charge
f.o.r. Free on rail
For. Foreign
f.p. Fully paid
F.P. Fire Policy
F.P.A. Free of Particular Average
Fr. French; Franc
Frt. Freight
Fs. Francs Swiss

g. gramme
G.A. General average
G.B. Great Britain
G.M.T. Guaranteed Mail Transfer
Gov.; Govt. Government
gr. grain; gross
grs. grains; gross
Gs. Guineas

H.M.C. His Majesty's Customs
H.M.S. His (*or* Her) Majesty's Service
H.O. Head Office

I.B. Invoice Book
Ier First (French, premier)
I/I Indorsement Irregular
Ins. or Insce. Insurance
Inst. Instant
Int. Interest
In trans. In transitu (in transit)
Inv. Invoice

IOU I owe you
Iss. Issue

J/A Joint Account

Kč. Czecho-Slovakian kronen
Kg. Kilogramme
Kilo; Kilog. Kilogramme
Kilos. Kilogrammes
Kr. Kreutzer (coin); Krone; Krona; Kronen

L Lira, *or* lire
£ Pound(s) Sterling
£E. Pound(s) Egyptian
£P Pound(s) Peruvian
£T. Pound(s) Turkish
L/A Letter of Authority
L/C Letter of Credit; London Cheque
Ld. Limited
Ldg., and dely. Landing and delivery
Led. Ledger
£g Pounds sterling
Li Lira, Lire
L.I.P. Life Insurance Policy
Lit Lire (plural)
£ s. d. Libræ, solidi, denarii (pounds, shillings, pence)
Ltd. Limited
Loro Their account

M. Thousand, Monsieur
-/m. Thousand (as 20/m)
m. metre; mark(s)
M/a My account
M/C Marginal Credit
M.D. Memorandum of Deposit
m/d Months' date (i.e. Months after date)
Mdse. Merchandise
Mem.; Memo. Memorandum
Mil. Milreis
Min. B/L Minimum Bill of Lading
M.I.P. Marine Insurance Policy
Mks. Marks (coin)
M/L Moneda Legale (page 605)
M/N. Moneda Nacionale (page 605)
M.O. Money Order
M.O.O. Money Order Office
Mo. Month
Mos. Months
M/R Mate's receipt

m/s Months' sight (i.e., months after sight)
M/T Mail transfer

N/A No advice (banking); New Account (Stock Exchange)
N.A. Non-acceptance
N/E No Effects
N/F No funds
N/m No mark
N/N No Noting
N/O No Orders (banking)
No. Number
Nom. Nominal
Nom. Cap. Nominal Capital
Nostro Our account abroad
N.P. Notary Public; No protest
n/p Net proceeds
Nos. Numbers
N.R. No risk (insurance)
N/S Not sufficient (banking)
N.S. New Style; New Series

% per cent.
‰ per mille
O/a On account of
Oc. B/L Ocean Bill of Lading
O/d On demand
O/D Overdraft
O.P. Open Policy (insurance)
O.S. Old style
Oz. Ounce

P/A Power of Attorney; Particular average
P/A Private Account (book-keeping)
P. and L. Profit and Loss
P/C Price Current; Petty Cash
p.c. Per Cent
P.C.B. Petty Cash Book
Pd. Paid
Per ann. Per annum, by the year
Per cent. Per centum (by the hundred)
Per contra On the other side
Per pro Per procurationem (on behalf of)
pf. pfennig *or* pfennige (plural)
Per Mille per thousand
Pm. Premium
P/N Promissory Note
P.O. Post Office; Postal Order

Prem.	Premium
P.O.D.	Pay on Delivery
P.O.O.	Post Office Order
p.p.	Per procuration
Pref.	Preference or preferred
p.pro	Per procuration
Pro forma	As a matter of form
Pro tem.	Pro tempore; for the time being
Prox.	Proximo; of the next month
Pta; psta	Peseta (Spanish coin)
P.X.	Please exchange
qy.	query
R.	Rupees; Rouble
R/D	Refer to Drawer (banking)
Re.	Rupee
reg.; regd.	Registered
Rm.	Reichsmarks
Ro.	Rouble(s)
R.P.	*Réponse payée* (reply paid)
Rs.	Rupees
Rx.	Ten rupees
$	Dollars
s.	Shilling; sou
s/c	*son compte* (his *or* her account)
Sh.	Share; shilling
Shipt.	Shipment
Shr.	Share
S/N	Shipping Note
Sov.	Sovereign
Sovs.	Sovereigns
S.P.	Supra Protest
St.	Sterling
Std.	Standard
Stg., Ster.	Sterling
T.	Tons; Tare
thl.	Thaler (German coin)
Thro' B/L	Through Bill of Lading
T.M.O.	Telegraph Money Order
T.O.	Telegraph Office
Tonn.	Tonnage
T/q.	Tale quale; *tel quel* (exchange)
T.T.	Telegraphic transfer
U.K.	United Kingdom
Ult.	Ultimo (of the last month)
Via	By way of
Vol.	Volume
Vostro	Your account with us
v.v.	Vice versa
W.P.A.	With particular average
Wt., wgt.	Weight
W/W	Warehouse Warrant
x.c.	Ex coupon
x.d.	Ex dividend
x. in.	Ex interest
x. new	Ex new shares
zl.	Zloty
&	And
&c.	And the rest, and so on
#	Number(ed)